AN INVESTIGATION OF THE FACTORS THAT INFLUENCE KNOWLEDGE SHARING BETWEEN ACADEMICS

W. R. FULLWOOD

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WILLIAM ROGER FULLWOOD

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Department of Journalism, Information and Communications

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Abstract

Managing knowledge has been a broadly successful strategy for many organisations during the last 30 years or so. Harnessing the power of both explicit and tacit knowledge enabled companies such as Apple and Chevron to gain competitive advantage over their competitors.

A key requirement for successful knowledge management is however that the individual should be prepared to share their tacit knowledge with others. Knowledge sharing factors in general have been subject to considerable research; however research on sharing knowledge in higher education is rare. This thesis seeks to the address the research gap by examining the factors that influence knowledge sharing between academic in UK universities.

The research contributes to the literature by investigating the influence of both organisational and individual factors on knowledge sharing between academics in a departmental context. The research approach has consisted of a two stage mixed methods process where a questionnaire survey of academics preceded a series of interviews.

Findings from questionnaires indicated that academics had a generally positive attitude and intention to share knowledge and believed that sharing would improve and extend relationships with colleagues. They were quite neutral about how they were led and had a generally higher level of affiliation to discipline than to institution, and also considered that departmental structure did not encourage sharing. Interview findings suggested that many academics were unhappy with the matrix structure and that there was a lack of clarity regarding roles and responsibilities within their departments. They singled out trust as the most important individual factor to influence knowledge sharing and culture as the most critical organisational factor.

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Chapter 1

Introduction

1.1 Research context

1.1.1 Knowledge Sharing

Since Drucker asserted in 1993 that knowledge was the only meaningful economic resource, organisations have been attracted by the idea of managing their knowledge in order to gain competitive advantage. This process has assumed growing importance in recent years as technology has enabled more effective collection and sharing of knowledge.

Knowledge management owes its origins to the work of Polanyi (1958) who was the first to define tacit knowledge as that which is stored in a person's head. Nonaka (1991) appreciated that, although a difficult process, this tacit knowledge could be translated into explicit knowledge; consequently unlocking the potential for the codification and retention of knowledge and expertise that normally leaves with particular employee. Thus knowledge could be shared and acquired by others within the organisation.

In the 1990's, in particular, organisations came to the conclusion that sustainable competitive advantage can result from managing knowledge effectively (Davenport and Prusak, 1998). This process was also linked to innovation by Nonaka and Takeuchi (1995), whilst Earl (2001:215) saw

knowledge management as '...central to process innovation and improvement, to executive decision-making, and to organisational adaptation and renewal.'

Hislop (2009) pointed out that knowledge management relies on knowledge sharing to be successful and knowledge is often tacit and embedded in individual employees. However, when organisations began to actively encourage knowledge sharing as part of a knowledge sharing approach it became clear that there were a variety of different organisational and individual factors involved in this process. Thorn and Connelly (1987) highlighted the dilemma involved in sharing knowledge where employees could volunteer knowledge which is then used to other's advantage without receiving any form of recompense.

Early knowledge management initiatives such as at Skandia were focused on technological systems for managing intellectual capital (Earl, 1994) but De Long and Fahey (2000) discovered that the advantages of new technology were not realised if organisational values were not supportive of knowledge sharing. According to Hislop, (2009) research affirmed the critical influence of culture and it's components on knowledge sharing. In addition, the overriding importance of introducing a flatter, flexible structure that supports cross-functional teams and knowledge networking, and indeed the socialisation process, was stressed by Walczak (2005) and Davenport and Prusak (2000).

The role of leadership was defined by Lakshman (2007) as ensuring that knowledge management is an ongoing process that is institutionalised into the organisation by encouraging communities of practice (Lave and Wenger, 1991) and the production of new knowledge. Politis (2001) demonstrated that a participative leadership style was highly conducive to the development of knowledge sharing practices. It was also argued by Carter and Scarbrough (2001) that Human Resource Management strategies should focus on

creating the conditions for knowledge sharing through recruitment policies and rewarding such knowledge sharing behaviour.

The critical importance of trust has been emphasised by Hislop (2009) and Andrews and Delahaye (2000). Furthermore Kankanhalli, Tan, and Wei (2005) found that if a culture accentuated trust the supposed costs of sharing could be assuaged. However interpersonal trust has been examined particularly in recent years because it affects the quantity and nature of knowledge that employees will share. Accordingly, Granovetter (1985) suggested that individuals particularly value knowledge and information gained from those they have previously dealt because of the trust that has been built up. Social capital has been highlighted by Hislop (2009) as particularly important for knowledge workers because will enable them to find the knowledge they need to contribute to their organisation. Leana and Van Buren (1999) suggested that this may be because of the resources and status gained through membership of effective networks.

The theory of social exchange (Emerson, 2006) has also been emphasised in connection with knowledge sharing. This suggested that economic theory can be utilised to comprehend the nature of exchange between people. Accordingly a calculation is made by persons considering certain behaviour on the potential gains that could be accrued from engaging in that behaviour. Bordia et al. (2007) indicated that knowledge can be thus conceptualised as a valuable commodity to exchange.

According to Nahapiet and Ghoshal (1998) suggested that potential knowledge sharers must be motivated to share in order to gain what they themselves consider to be valuable and thus make a calculation on whether benefits of sharing exceed costs. Nonaka and Takeuchi (1995) suggested that tacit knowledge is embedded in personal belief structures and Bock et al. (2005) made a strong connection between those structures and motivation to share and points out the significance of beliefs in the possibility

of both extrinsic and intrinsic rewards for sharing. However, Bock's own research found that extrinsic rewards were a disincentive to sharing in contrast

The benefits of knowledge sharing in terms of innovation which leads to competitive advantage have been stressed by Nonaka and Takeuchi (1995). Davenport and Prusak (1998) particularly highlighted knowledge sharing across teams as essential for competitive advantage whereas Dyer and Singh (1998) particularly emphasised the benefits of establishing knowledge sharing routines with partner companies.

However, discussions have so far focussed only on knowledge sharing in the private and public sector and given the widespread utilisation of knowledge management initiatives in those sectors (Grossman, 2006), it may be opportune to consider what knowledge management could offer to the Higher Education sector in the UK.

1.1.2 UK Higher Education Sector

The UK Higher Education sector is very different from the private and public sector in several important ways. Academic freedom and autonomy have been particularly strong traditions, and although have recently been under threat from the new managerialist movement (Deem 2004), they still remains distinguishing features of the sector (Cronin, 2000).

Taylor (2006) drew a broad distinction between pre-1992 universities that still possess high level of academic autonomy and post-1992 universities that are more bureaucratic in character and with less freedom for academics. Departmental structures in universities reflect this distinction according to Lomas (2006). Pre-1992 universities are characterised by decentralised autonomous departments whereas the model for pos-1992 universities is more centralised and hierarchical. Structure and history have naturally helped shaped the culture of different universities (Dopson and McNay,

1996), although there is a lack of research on university cultures in general. Dopson and MacNay (1996) did however classify cultures into Collegial, Bureaucratic, Entrepreneurial and Corporate, whilst Lee (2007) focussed more on the competing loyalties of individual academics to institution and discipline.

Much more research has been in evidence in terms of research on academic leadership in recent years. Yielder and Codling (2004) distinguished academic leadership that recognised attributes such as expertise and personal qualities from managerial leadership, which emphasises position power, control and authority. Bolden et al. (2012) pointed out that the strong wishes of academics for autonomy could limit the formal management role. Furthermore, leadership could also be perceived as existing outside these formal roles in positions such as PhD supervisor.

Overall, universities have a high level of academic freedom and tendency towards strong disciplinary sub-cultures. Consequently, leadership has proved challenging and even though these factors are less pronounced in the post-1992 sector. As a result, the knowledge sharing environment in universities is very different from many other organisations in the public and private sector.

1.2 Research Question

The value of knowledge management to different types of organisations has been established. Clearly also knowledge management initiatives depend on a willingness and motivation of employees to share knowledge in order to succeed (Hislop, 2009). The UK Higher Education sector has unique characteristics described above that distinguish it from other sectors, however research concerning knowledge sharing in this area is notably lacking (Kim and Ju, 2008) with the exception of some studies in Malaysia (Sohail and Daud, 2009; Cheng, Ho and Lau, 2009). Consequently, there is a need to address this research gap by focussing on the barriers and enablers

to knowledge sharing in academia. Thus the following research question emerges

'How can knowledge sharing between academics be improved'

In order to answer the research question the following aims and objectives need to be accomplished.

Aims

1. Contribute to knowledge sharing literature on the higher education sector by studying knowledge sharing between academics.
2. Suggest ways to improve knowledge sharing processes in university departments
3. To develop a model of factors that affect academic staff in relation to knowledge sharing.

Objectives

1. Critically review knowledge management and knowledge sharing literature
2. Critically review literature on the nature of higher education as a context for knowledge management.
3. Perform quantitative research to identify the types of knowledge shared and factors that influence knowledge sharing between academics.
4. Develop a model of knowledge sharing factors in order to test hypotheses concerning the influence of different knowledge sharing factors on attitudes and intentions.
5. Critically evaluate the research findings as a basis for recommendations regarding the improvement of knowledge sharing processes in university departments.

1.3 Research Methodology

One objective of the investigation was to generate some hypotheses with regard to the influence of different knowledge sharing factors in higher education. A potential also existed to sample a reasonably large population and therefore a quantitative approach is indicated (Easterby-Smith et al. 2002). However, Wang and Noe (2010) suggested that a qualitative approach provides for a deeper investigation of the organisational context and factors such as culture and trust are indeed woven inextricably into this context. Clearly also, the researcher's own position as an insider meant that his perspectives may be different from an outsider and this factor would need careful consideration (Bartunek and Louis, 1996).

The growth of mixed methods research (Bryman and Bell, 2011) has meant that the choice of methodology is not a straight choice between and quantitative and qualitative. These two types of research can mutually support each other and enable triangulation (Kaplan and Duchon, 1988), and more robust conclusions can ensue from a combination of questionnaires and interviews (Teddie and Tashakkori, 2009).

Consequently, a mixed approach has been chosen for this investigation. A pre-existing questionnaire (Bock et al. 2005) was adapted for the quantitative section of the data collection. This questionnaire had already been piloted and validity and reliability had been established in the process of structural equation modelling. It had however been used to assess the influence of knowledge sharing factors on a sample of managers in South Korea. According to Bock et al. (2005) collectivist tendencies and a high level of bureaucracy were likely to affect the behaviour of organisational members in this context. Consequently, some modifications and additional questions were needed for the UK higher education context.

1.4 Organisation of Thesis

Chapter 2 **Concepts of Knowledge and Knowledge Management** discusses knowledge as a concept and the origins of knowledge management. Different approaches to knowledge management are then explored and the movement away from a systems based approach to a sociocultural approach is depicted.

Chapter 3 **Knowledge Sharing** focuses on sharing knowledge as a key component of knowledge management. Organisational barriers and enablers to sharing such as culture, leadership and structure are investigated as are individual factors such as trust and social capital.

Chapter 4 **Knowledge sharing in Universities** sets the context of the thesis by examining the context of the higher education sector and the role of government in shaping today's landscape. Factors affecting knowledge sharing discussed in Chapter 3 are explored in the context of higher education, and the limited research on knowledge management and sharing in this context is summarised.

Chapter 5 **Research Methodology** examines the range of research paradigms and methodologies available and issues in qualitative and quantitative research as well as looking at approaches that have been utilised with regard to knowledge sharing. A rationale for the chosen research approach is provided and a research model is developed to depict relationships between factors that influence sharing. In keeping with the mixed methods approach, a questionnaire survey and interviews are utilised and pertinent issues regarding data collection are discussed.

Chapter 6 **Descriptive Statistics** focuses on the questionnaire results obtained from the quantitative stage of the research. Demographic details for respondents are provided then the questionnaire results are presented and discussed in detail.

Chapter 7 **Measurement and Model Development** again concentrates on the quantitative stage of the thesis. Initially, Exploratory Factor Analysis is performed using SPSS in order to confirm the loadings of the items measuring latent variables affecting sharing. This is followed by Confirmatory Factor Analysis utilising Structural Equation Modelling in order to test and develop a model that shows the relationship between these factors, and attitude and intention to share knowledge. Lastly, results of the hypotheses testing are presented.

Chapter 8 **Qualitative Data.** This chapter initially locates qualitative data collection within the mixed methods approach. Demographics of interviewees are then described and this is followed by a discussion of the concept of thematic analysis. The actual themes emerging from the interviews are then detailed and illustrated by quotations from interviewees. Suggestions from interviewees with regard to how to improve knowledge sharing are also reported.

Chapter 9 **Discussion** focusses on synthesising the results of descriptive statistics, hypotheses testing and findings of semi-structured interviews with the literature review with a view to evaluating and interpreting the findings.

Chapter 10 **Conclusions** concentrates on evaluating the contribution of the thesis to the literature on knowledge sharing in the higher education sector. This is followed by a discussion on ways to improve the knowledge sharing process in university departments. Research limitations are then identified along with implications for future research. Finally some reflections on the PhD process overall are presented.

Chapter 2

Concepts of Knowledge and Knowledge Management

The purpose of this chapter is to define the nature of knowledge itself and establish the importance of tacit knowledge. A consideration of tacit and explicit knowledge leads onto an examination of knowledge category models. The development of knowledge management is then discussed with reference to conceptual models such as Nonaka's SECI model. Early models are shown to be rooted in technology but come to reflect the growing importance of culture.

2.1. Definitions of Knowledge

The concept of knowledge has was first defined by Plato (1953) as 'justified true belief', and an understanding of the concept of knowledge has been essential to the study of epistemology and philosophy since the ancient Greek era. Philosophers from the East have also emphasised the importance of knowledge in understanding spiritual aspects, whilst practical knowledge has always been valuable (Kakabadse et al. 2003). Bacon (1605) suggested that knowledge itself is power thus emphasising the importance of knowledge acquisition whilst Foucault (1980) advanced the argument by asserting that knowledge inevitably engenders power.

These early conceptualisations of knowledge were positivist in character (Kakabadse et al. 2003). However, many philosophical perspectives have

emerged since particularly in the twentieth century such as constructivism, critical theory and empiricism although there has been no agreement with regard to the exact nature of knowledge. The concept of socially constructed knowledge has resonated particularly within the areas of organisational learning and knowledge management because in business, knowledge cannot be perceived as an objective certainty (Maier, 2002).

According to Kakabadse et al. (2003), there has been a revitalised discourse on the position of knowledge in the organisation during the twentieth century encompassing such disciplines as Economics, Organisational Theory and Philosophy. Debates about philosophical knowledge have stressed the epistemological aspects of what it is comprised of (Kakabadse et al. 2003), thus raising the question of whether it can be viewed as objective or subjective. For example, Cilliers (2005:606) believed that the central questions around knowledge are '….*what* can we know about the world, *how* do we know it, what is the *status* of our experiences'. From an economic point of view, the value of knowledge within the company is visualised as the new form of capital and the concept of the knowledge economy was stressed by Drucker (1993). Knowledge is then seen as being vital for the organisation to gain competitive advantage over others (Davenport and Prusak, 1998).

Drucker (1989) suggested that knowledge is information that becomes the basis for action. It has been also defined by Ahmed, Kok and Loh (2002, p 9) as being '….in the user's subjective context of action which is based on the information that he or she possesses.' This emphasised the idea of knowledge leading to particular behaviour. Boisot and Cilliers both referred to the experience factor in their definitions of knowledge. Similarly, Boisot (1998) defined knowledge as '…a capacity that builds on information extracted from data or the set of expectations that an observer holds with respect to an event'.

2.2. Tacit and Explicit Knowledge

The modern philosophy underpinning knowledge management can be traced to the ideas of Gilbert Ryle and in particular Michael Polyani. Ryle (1949) introduced the concept of *knowing how,* which he termed intelligence and *knowing that*, which amounted to ownership of tacit knowledge. Polyani (1962) suggested that there are two types of knowledge. Explicit knowledge can be codified into instruction manuals for example whereas tacit knowledge is that which is stored within a person's head and is '….non-verbalised, intuitive and unarticulated'. He also famously wrote that 'We know more than we can tell' and used the process of balancing on a bicycle as an example of tacit knowledge that would be so difficult to explain to another person (Polyani, 1967).

Nonaka (1995) expanded the notion of tacit knowledge still further by identifying technical and cognitive dimensions. The cognitive component was linked to the concept of mental models, which contained the values, beliefs and paradigms that enabled humans to make sense of their world. The technical aspect included skills and know-how. Nonaka (1995:60) also believed that the sharing of tacit knowledge was an act of '…simultaneous processing of complexities', in contrast to the sharing of explicit knowledge which is often about previous occurrences.

Despite this distinction, he believed that tacit and explicit knowledge are complementary to each other in the knowledge conversion process between individuals. Nonaka's belief in the practicality of a knowledge conversion process clearly meant that he considered knowledge to be an objective rather than the culturally embedded entity described by Cook and Brown (1999) and Hislop (2002).

2.3 Perspectives on the nature of knowledge

Two broadly contrasting perspectives on knowledge exist according to Hislop (2009). The objectivist approach is strongly linked to positivism and sees knowledge as a commodity or object where explicit knowledge has primacy over tacit knowledge and can be considered as detached from its creator. There is also an assumption that knowledge tacit knowledge can be converted into explicit knowledge (Hislop, 2009). In contrast the practice-based perspective that draws on the interpretive approach. This viewed knowledge as culturally embedded in human action, socially constructed and therefore open to subjective interpretation (Hislop, 2009).

Similarly, McAdam and McCreedy (2000) contrasted two paradigms of knowledge construction. The scientific viewpoint emphasises the cognitive and factual aspects of learning whereas the social paradigm emphasises that knowledge can be constructed socially taking account of the political, social and historical context of the organisation.

2.4 Knowledge Creation Models

Consideration of the interaction between tacit and explicit knowledge, and the effects of this process on innovation led Nonaka to develop his model of Socialisation, Externalisation, Internalisation and combination (SECI), where each process represented a differ mix of tacit and explicit elements.

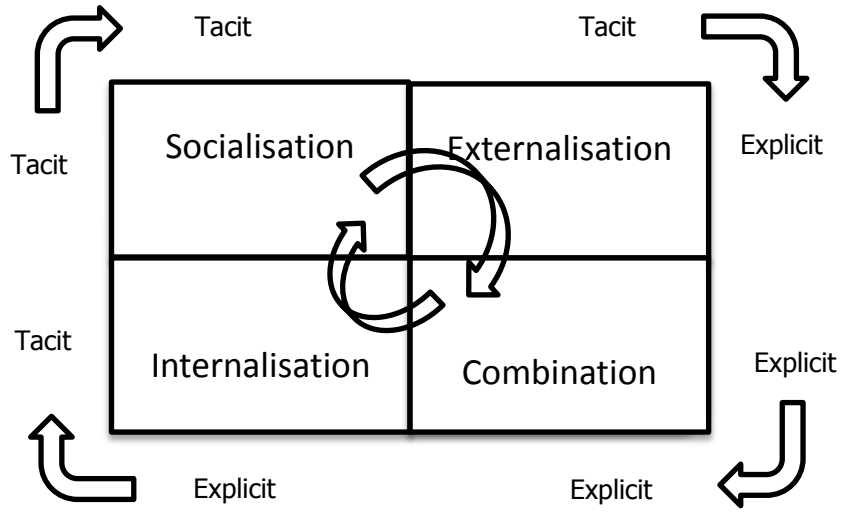

Figure: 2.1 Four modes of knowledge conversion

Source: Nonaka (1994:18)

The model depicted above was Nonaka's original model of knowledge conversion. The *socialisation* process involved sharing experiences that led to '….shared mental models and technical skills' (Nonaka, 1995:62). An example of this could be an apprentice learning from an expert. Such knowledge could also be acquired through an informal social experience. The example used by Nonaka was the way in which a bread maker kneads and twists the dough to make bread with a superior flavour. In this case, no words were necessary, only observation and imitation.

Externalisation, concerned the conversion from tacit to explicit knowledge. In Nonaka's view, the act of sharing basic tacit knowledge of how to make bread with colleagues would be a pertinent example of this process. Alternatively, a metaphor or analogy could form the all-important link between these two forms of knowledge.

Nonaka also believed that new knowledge could be created in an explicit to explicit process, which was known as *combination*. In this process, knowledge is collected and disseminated and pooled with other knowledge

to make a composite body of knowledge. Nonaka considered that the learning process at School and University reflected the combination process.

Internalisation, the final process, referred to the process of transforming explicit into tacit knowledge. Codified knowledge such as that contained in manuals, and also verbal accounts, such as a Leaders' autobiography that can help the reader or listener experience the situation which may then change into a mental model that may be shared with others.

The SECI model depicted the knowledge creation process by means of a spiral in the centre of the model to emphasise that the processes are amplified as knowledge moves up a hierarchy of levels from individual to group then lastly to organisational level where it could be codified into repositories (Nonaka et al. 2000). It has been highly influential in influencing consideration of the interplay between tacit and explicit knowledge and has certainly assisted in the conceptualisation of knowledge and its associated processes. A number of authors have however pointed to a range of limitations with the model. For example, Tsoukas (1996) asserted that that explicit and tacit form of knowledge should not be viewed as separate components and critically that '….tacit knowledge is not explicit knowledge internalised'. Tsoukas (2002:15) further considered that Nonaka and Takeuchi's depiction of tacit knowledge as knowledge-not-yet-articulated was fundamentally flawed because tacit and explicit knowledge are essentially '… two sides of the same coin'.

McAdam and McCreedy (1999) depicted Nonaka's model as an attempt to categorise knowledge but suggested that the knowledge transference process is much more involved than the matrix suggested by Nonaka, which in their view is mechanistic in character. Similarly, Bereiter (2002) suggested that the model lacked an explanation of how depth of understanding can develop. Gourlay (2006:1418) was sceptical about some aspects of the model. He considered that technical tacit knowledge is transferred in the

case of the breadmaker, but considered that lack of a cognitive mapping exercise discredited the Externalisation process. In addition the metaphor and analogy used by Nonaka is according to Gourlay (2006) is an untested hypothesis. Gourlay (2006) in fact felt that the final two components of Nonaka's model were the least supported by research. Combination was represented as lacking in detail and Nonaka's suggestion that transference of knowledge during an MBA or other educational process is a purely explicit to explicit one is dismissed as lacking in seriousness. Gourlay (2006) also considered the explicit to tacit process visualised by Nonaka in the reading process as vague and not supported by research into the reading process.

Glisby and Holden (2003) were concerned that Nonaka's ideas may be suitable only for the Japanese context and cited General Motor's attempt to apply Japanese production systems in 1998 where the explicit knowledge was transferred but the important element of extensive worker participation worker participation was absent as was the commitment and loyalty inherent in the culture of the Japanese worker. The examples of Toshiba and Matsushita are also given as examples of Japanese companies who have failed to share knowledge effectively.

McAdam and McCreedy (1999) compared the SECI model with Boisot's knowledge category model (1987). Like Nonaka's model it attempted to categorise knowledge in four distinct ways but unlike Nonaka does not map the processes involved thus the knowledge creation aspect is missing.

Proprietary knowledge was considered by Boisot (1987) to be a source of power that can be exchanged for some form of reward thus connecting with Bacon's view that knowledge is power (1605). *Public knowledge* is naturally that which is freely available in journals and texts for example. *Personal knowledge* is characterised as everyday experiences and recollections such as of time spent with friends. *Common sense* is acquired through interaction with others such as at school, work or home. McAdam and McCreedy (1999)

pointed out a number of similarities between Nonaka's and Boisot's model and although *explicit* and *tacit* labels are not used these may match up to some extent with codified and uncodified. If this is the case, proprietary knowledge (a type of explicit knowledge) could be considered a more important commodity than tacit, which would contradict generally accepted views of the importance of tacit knowledge (Lam, 2000).

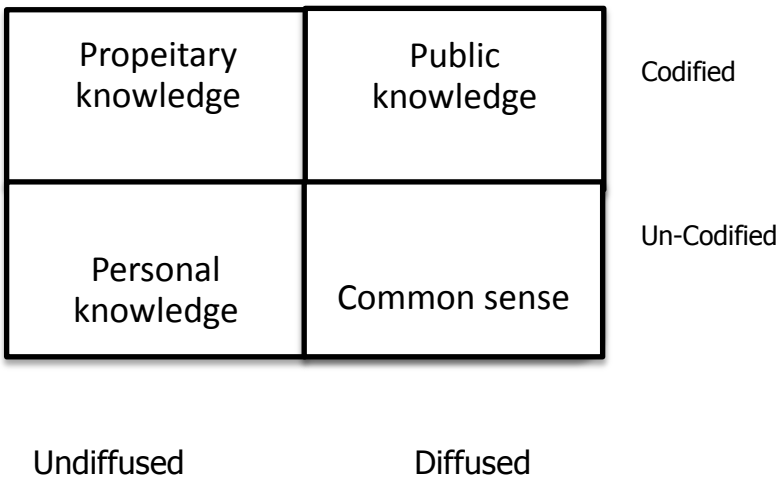

Figure 2.2: Knowledge Category Model

Source: Boisot (1987)

By implication Nonaka's SICE model and Boisot's model conceptualise tacit and explicit knowledge as two separate entities as visualised in the objectivist perspective. This was contradicted by Polyani's position that that all knowledge was either tacit knowledge or embedded in tacit knowledge (1969).Tsoukas supported this view by asserting that '….tacit knowledge is the necessary component of all knowledge' and Cook and Brown (1999) similarly held the view that tacit knowledge cannot be turned into explicit and vice versa. It is therefore clear that this proposed inseparability would undermine the basic premise of these models.

More recent research has rebuffed the objectivist perspective of knowledge and affirmed the inseparability of tacit and explicit knowledge (Hislop, 2009). The extent to which tacit knowledge can be codified has also been a subject of significant dispute (Cowan et al. 1999). However, it is likely that lecturers and researchers will in any case be largely unaware of these debates. Consequently for the purposes of this research it has been decided not to make specific reference to *tacit* and *explicit* knowledge in the research questionnaire and interviews.

2.5 Knowledge Management

2.5.1 Knowledge Management Definitions

It may be appropriate to define the term *Knowledge Management* itself at this stage prior to a discussion of knowledge management models.

Some of the earliest forms of knowledge management could be observed when Greeks such as Plato and Aristotle began to collect books written on papyrus and create private libraries. The first public library was commissioned by Julius Caesar mainly as a result of the influence of conquered Greek culture (Jashapara, 2004). Craft guilds in the thirteenth century were based on knowledge management principles (Wiig, 1999) and the collation of knowledge in monastic libraries also played a significant role in the management and dissemination of knowledge in Britain until the

dissolution by Henry VIII. The spread of the printed word was greatly accelerated by Caxton in the 15th Century with the invention of the printing press. Caxton was also credited with helping to spread knowledge through translation of many significant texts.

The most important recent development was of course the development of the computer and the comparative decline of the printed word. This quickly led to a massive increase in the capacity or knowledge repositories and the ability to transfer knowledge over great physical distances with almost instantaneous speed and the rise of email as a communication medium largely of choice (Jashapara, 2004).

The nature of knowledge itself has been changing according to Drucker (1993) to something that has to be proved to be effective in action, structured, highly specialised and can be judged by the results of its application. Drucker contrasted this situation to definitions of knowledge through history that focussed on a broad based education as a creator of the educated knowledgeable person. Davenport and Prusak (2000) considered that knowledge has become much more scattered and fragmented as companies, driven by forces of globalisation and technology, have internationalised. This has provided a rational for them to manage and distribute what they know more effectively.

There is no universally accepted definition of knowledge management although many attempts to define knowledge management have been made. One explanation for this disparity is that the definitions will vary depending on the author's viewpoint. The lack of consensus was discussed by Lloria (2008) who discussed the different perspectives identified by researchers. However, some themes such as technological systems, intellectual capital and the influence of culture and social constructivism were common to many approaches (Lloria, 2008). In order to reflect this diversity some knowledge management definitions are shown in the table below.

Table 2.1: Definitions of Knowledge Management

The process of critically managing knowledge to meet existing needs, to identify and exploit existing and acquired knowledge assets and to develop new opportunities. (Quintas et al.1997:86)
The explicit and systematic management of vital knowledge and its associated processes of creating, gathering, organising, diffusion use and exploitation, in pursuit of organisational objectives. Skyrme (1999)
The process by which the organisation generates wealth from its intellectual capital or knowledge-based assets'. Bukowitz and Williams (1999)
The identification and communication of explicit and tacit knowledge residing within people, processes, products and services. (Bollinger and Smith, 2001)
The crux of the issue is not information; information technology ... the answer turns out to lie more with psychology and marketing of knowledge within the family than with bits and bytes (Peters, 1992).
A conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organisational performance'. (O'Dell and Jackson, 1998)
In social and political terms, KM involves collectivizing knowledge so that it is no longer the exclusive property of individuals or groups (Carter and Scarbrough, 2001).

Most of the definitions in Table 2.1 definitions stress the role of information systems and conceptualise knowledge as an intellectual resource. The effect on organizational performance is also a common concern as well as issues around people and how to ensure they have the right knowledge for their role. Significantly for this thesis, all the definitions use terminology such as diffusion, communication and sharing thus emphasizing the overriding need for employees to share their knowledge in whatever approach is taken to knowledge management. Indeed, Hislop (2009) pointed out the vital importance to any knowledge management approach of motivating workers to share their knowledge.

2.5.2 The development of Knowledge Management models

Many authors have attempted a taxonomy of knowledge management models (Lloria, 2008). Early models of knowledge management were described by Scarbrough and Carter (2001:54) as being driven by

information technology systems. They were also characterised by Swan and Scarbrough (2001:914) as '…. perspectives that emphasise knowledge capture and codification through the introduction of IT tools', and also by Alvesson and Karreman (2001:1004) as '… extended libraries'.

Some authors identified the next wave of knowledge management models as those that focussed on the retention of intellectual capital as an intangible asset such as Lank's model (1997). Lank suggested a process that should be followed that the Chief Knowledge Officer should follow which consists of:

1. Identifying tacit and explicit knowledge
2. Creating repositories and other sharing mechanisms
3. Identifying gaps in knowledge
4. Managing the process and measuring returns on financial outlay

A reward strategy involving monetary rewards and recognition was seen as key to embedding knowledge sharing behaviours. This model was viewed by McAdam and McCreedy (1999) as an example of the depiction of knowledge as a commodity to be managed and distributed with IT playing a critical role.

Skandia, Dow Chemical and Buckman Laboratories were identified by Bukowitz and Petrash (1997) as being in the forefront of the intellectual capital approach managing and measuring intellectual assets. Intellectual capital is defined here as a combination between human, customer and organisational capital to add value. Both Skandia and Dow appointed a Director of Intellectual Capital in order to demonstrate their commitment to managing knowledge within the companies (Hiser, 1998). Naturally, IT systems figured prominently in intellectual capital models as vehicles for distributing codified knowledge, although MacAdam and McCreedy (1999) did not identify a technology driven approach, instead preferring to classify two main approaches as intellectual capital models and socially constructed models.

According to Swan *et al.* (1999), the problem with IT led knowledge management was that tacit knowledge does not often lend itself to codification because of contextual and personal characteristics inherent in that knowledge. Similarly, McDermott (1999) cites the example of a company that set out to construct an online database of good practice. This was completed but not used due to the generalised nature of the content. McDermott also identified that that virtual teams normally indulge in information sharing only after a face-to-face meeting and not because a groupware system has been installed to facilitate contact.

Scarbrough and Swan (2001:4) were critical of the 'mechanistic' nature of much of the associated trappings of knowledge management and attributed this to as an attempt by consultants among to commercialise knowledge management simplistically as a means to harness intellectual capital and thus gain competitive advantage. They bracketed Business Process Re-engineering and knowledge management together as two processes that have partly owed their rise to a growing interest in technological solutions to management problems.

A further wave of knowledge management literature focussed on 'socially constructed models' that take account of social processes and the learning process within the organisation (McAdam and McCreedy, 1999:97). This meant they were broadly aligned to the practice-based perspective of knowledge where the creation of a knowledge sharing culture and communities of practice were critical factors (Petrash, 1996; Hislop, 2009). McAdam and McCreedy (1999) further suggested that the socially constructed approach implied a new paradigm of knowledge management where organisational learning is highly valued and employees are trusted and empowered to share their knowledge and use it creatively.

Demarest's approach was deemed by Lloria (2008) to be typical of the socially constructed models (1997). Previous approaches that suggested that

knowledge creation could be related to objective measures and the balance sheet were rejected. Instead, Demerest (1997), shown below in Figure 2.3 suggested that tacit knowledge is often held by a comparative few members in the organisation and some high performance teams and will not be distributed unless there is an incentive for doing so. Organisations are conceptualised as knowledge economies.

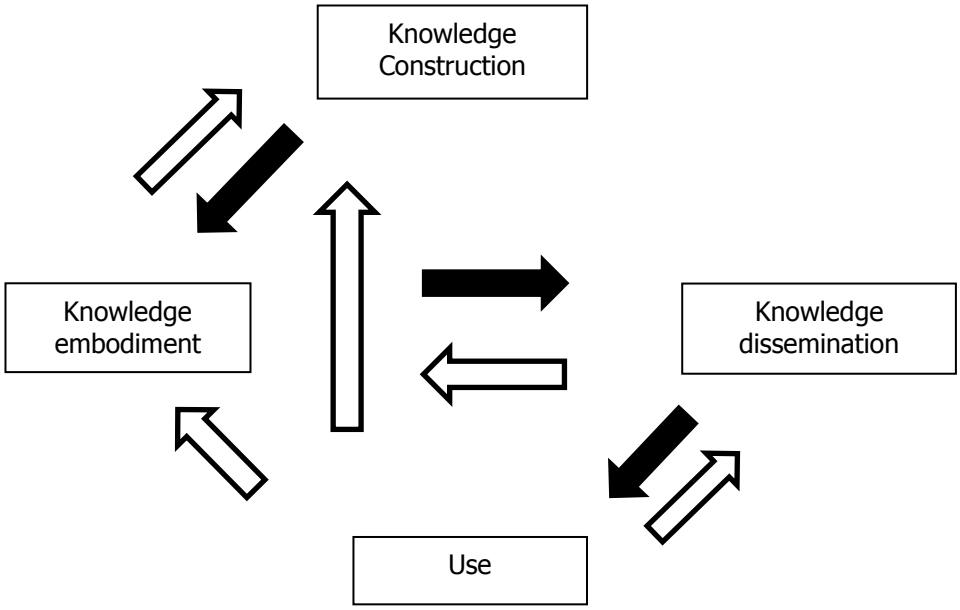

Figure 2.3: Knowledge Management Model
Source: McAdam and McCreedy (1999:98) Adapted from Demerest (1997).

A staged process for knowledge management in the model is suggested which consists of the following stages:

1. Construction (involving creation, theft, traduction and reinterpretation)
2. Embodiment (transformation of tacit knowledge into processes practices and cultures

3. Dissemination (embodied knowledge is distributed through the value chain).
4. Use (application of knowledge to problems).
5. Management (some form of monitoring and measurement by knowledge specialists).

According to Demarest (1997:383), the need to maintain a '…healthy corporate culture' has become much more central because of the increasing job mobility of knowledge workers and the difficulty of valuing their worth to the company. De Long and Fahey (2000) suggested there is a strong a link between culture and knowledge management because the behaviour of employees is determined by the practices, norms and values of the company. Similarly, Gold and Malhotra (2001) asserted that influencing culture is the most important factor in attempting to manage knowledge.

2.2.5 Personalisation and Codification Approach

Hansen et al. (1999) suggested that it is important to judge the merits of different approaches on their success in differing contexts and identified two distinct approaches. First of all, the codification approach consisted of documentation of knowledge developed from previous experience on repositories. Distance learning played an important role and there is also an incentive to add knowledge to the repository. In fact, Hansen et al. (1999) cited the success of Ernst and Young in developing and winning bids by using knowledge already codified.

The second approach known as personalisation places far greater emphasis on face-to-face contacts and according to Hansen et al. (1999) was suited to individualised situation where a creative solution is required. This often involved the use of small teams. Boston Consulting Group and McKinsey are cited as successful examples of these types of knowledge sharing strategy. Hansen et al. (1999) did recommend the personalisation approach when

innovative or customised products are involved and when exchange of tacit knowledge is crucial.

Summary

This chapter began by looking at the concept of knowledge itself and conflicting views on the inseparability of tacit and explicit knowledge. Nonaka (1995) introduced an influential model of knowledge creation which has been much critiqued and this was discussed along with Boisot's model of knowledge (1987). Knowledge management definitions were presented and the need to share knowledge emerged a common theme. The development of knowledge management models discussed the early primacy of IT based models that stressed the importance of information technology systems. Later models emphasised the importance of socially constructed knowledge and creating a culture for sharing. Demerest (1997) introduced the idea that tacit knowledge is possessed by few and they need to be motivated to share their knowledge and De Long and Fahey (2000) stressed the importance of culture in successful knowledge management. Hislop (2009) emphasised the crucial role of sharing to successful knowledge management. Accordingly, as a foundation for this research, the next chapter will focus on the way organisational members can be motivated to share their knowledge and the influence of the organisational and individual factors that can affect knowledge sharing.

Chapter 3

Knowledge Sharing

In this chapter definitions of knowledge sharing are initially discussed. The theoretical context of major factors that affect the organisational and individual environment for knowledge sharing in organisations are identified and considered. Subsequently, research on the influence of different knowledge sharing factors is considered.

3.1 Definitions of Knowledge Sharing

Demerest (1997) introduced the idea that tacit knowledge is held by few and they need to be motivated to share their knowledge. Eisenhardt and Martin (2000) similarly affirmed that a key objective of knowledge management initiatives is the systematic promotion of knowledge sharing among organisation members. Hislop (2009) also pointed out the crucial role of sharing in successful knowledge management.

There are many definitions of knowledge sharing but no definitive meaning has emerged. Lee (2006:325) believed simply that knowledge sharing '….requires the dissemination of individual employees' work-related experiences and collaboration between and among individuals, subsystems, and organisations'. According to Davenport and Prusak (1998:5) knowledge sharing constituted '… a fluid mix of framed experience, values, contextual information, and expert insights'. Van der Hoof and Ridder (2004:118)

described it as '…the process where individuals mutually exchange their knowledge and jointly create new knowledge'. They believed that knowledge sharing involved two distinct processes called knowledge donating and knowledge collecting and deemed both processes essential for enhancing organisational knowledge. Van den Hoof and De Leeuw van Weenen (2004) also considered that such knowledge once shared expanded in value.

The definitions above do not distinguish the type of knowledge shared thus the importance of the sharing of different types of knowledge is emphasised. However, Davenport and Prusak (1998) whilst acknowledging the importance of sharing explicit knowledge through an information technology systems approach stressed the critical significance of sharing tacit knowledge. Similarly, Spender (1996) emphasised the sharing of both tacit and explicit knowledge to gain competitive advantage over others. Given that tacit knowledge resides in the personal experience of individuals) rather than in databases (Polyani, 1958), it is naturally crucial that individuals in organisations should share their tacit as well as explicit knowledge.

In addition, the store of knowledge that results from sharing can be conceptualised as a public good that builds up over time (Cabrera and Cabrera, 2002), although some workers will inevitably fail to share but still utilise knowledge given freely by others. In this context employees may consider the benefits and drawbacks of sharing their knowledge before deciding whether to share (Hislop, 2009). Consequently, an understanding of factors that affect propensity to share is critical for successful sharing and in turn the success of knowledge management initiatives.

3.2. Theoretical Context

According to Bock et al. (2005) motivation to share knowledge is affected by distinct groups of factors relating to the organisational and individual context. Gagne (2009) also suggested a similar division of factors in her development of a model of knowledge sharing motivation.

In the organisational context, culture has widely been acknowledged as fundamental in managing and sharing knowledge (DeLong and Fahey, 2000; Ardichvili et al. 2003; Kankanhalli et al. 2005). Similarly structure (Gold et al. 2002) and leadership (Holsapple and Joshi, 2002) has been inextricably linked to knowledge sharing behaviour and the theoretical context for these organisational factors will be examined in the next section.

Studies on individual motivators to share have often utilised the Theory of Reasoned Action as a basis for research (Bock et al. 2005; Kim and Lee, 2006) and individual sharing behaviour has been strongly linked to social capital theory (Bock and Kim, 2002) thus the theoretical context for these factors will also be analysed in section 3.4.

3.3 Organisational Context

3.3.1 Organisational Culture

De Long and Fahey (2000) suggested that culture affects basic assumptions about the type of knowledge that is valued within the organisation as well as establishing norms between organisational members that can affect the process of knowledge sharing. As such culture establishes the context for interaction between organisational members and can motivate knowledge sharing behavior.

3.3.2 Organisational Culture as a concept

According to Baker (2002) the concept of Organisational Culture came to prominence in the 1980's although its origins could be attributed to the human relations school. Siehl and Martin (1984:227) described organisational culture as '….the glue that holds organisations together through a sharing of patterns and meaning'. Schein (1985, p 6) defined organisational culture as '….The pattern of basic assumptions that given group has invented, discovered or developed in learning to cope with its problems of external adaptation or internal integration'. Both definitions

stress the importance of patterns in terms of meaning and assumptions but Schein's definition goes further in pointing out the relevance of such patterns to external and internal perspectives. Thus the implication is that when the external or internal environment changes such assumptions may need to change.

Schein (1985) later enlarged on this definition to identify three levels of culture where culture manifests itself at the first level in easily visible artefacts and symbols of the company such as the mission statement, company logo, and also style of accommodation whether single person offices or open plan. The second level concerns organisational beliefs and values. They are not so obvious and lie just beneath the surface of the organisation's consciousness and can be fashioned by the life experiences of members of the organisation. The third level of consists of unspoken rules and tacit assumptions, which according to Hatch and Cunliffe (2006:98) are 'what members believe to be reality and thereby influence what they think and feel and are therefore taken for granted.'

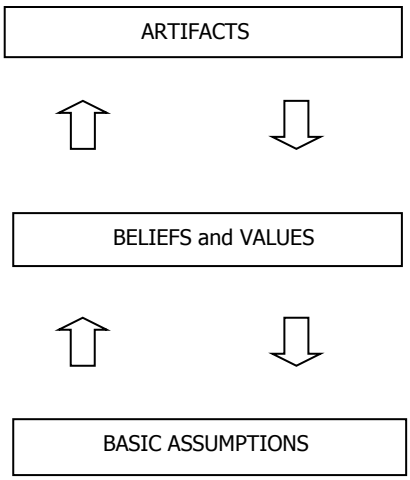

Figure 3.1: Schein's three levels of culture
Source: Schein (1985:44)

According to De Long and Fahey (2000) particular sets of cultural values and norms can help or hinder knowledge sharing and, value systems that accentuate individual power amongst organisational members will lead to hoarding of knowledge. De Long and Fahey (2000) suggested some positive values as examples such as the belief that every interaction with customers is important, and this could lead to the creation of useful customer knowledge. In contrast, a negative value could be a perception that a decrease of personal power is the result of knowledge sharing. The artefacts referred to by Schein (1985) were called *practices* by De Long and Fahey (2000) but were essentially the same thing. Suggested examples of these were weekly staff meetings and performance reviews. The conduct of staff meetings could be encouraging or discouraging to knowledge sharing and this could depend on the attitude of the facilitator to new and different opinions. More detailed examples of artefacts are shown below.

Table 3.1: Artefacts of Organisational Cultures

General Category	***Specific Examples***
Physical manifestations	• art/design/logo • buildings/décor • dress/appearance • material objects • physical layouts
Behavioural manifestations	• ceremonies/rituals • communication patterns • traditions/customs • rewards/punishments
Verbal manifestations	• anecdotes/jokes • jargon/names/nicknames • explanations • stories/myths/history • heroes/villains • metaphors

Source: Hatch and Cunliffe (2006:92)

3.3.3 Classifications of Organisational Culture

Cultural classifications are important because according to De Long and Fahey (2000) it is important to be aware of the type of culture you are working in because they affect what type of knowledge is considered important and relevant to both cultures and subcultures. A number of classifications have been developed. One of the most significant is the one proposed by Handy (1991) where culture is divided into Club, Role, Task and Existential.

- *Power Culture* emphasises the primacy of the central figure in the organisation. A few individuals hold power, trust each other and communicate personally. Few layers of bureaucracy exist and it is typical of small entrepreneurial organisation.
- *Role Culture* is more bureaucratic in character and suited to the functional structure. As the name suggests, power emanates from the role rather than the character of the individual within that role.
- *Person Culture* focuses on the interests and decisions of individuals who can form a group to achieve a particular aim. Control systems largely operate on mutual consent and personal rather than position power predominates.
- *Task Culture (also known as existentialist culture)* is typified by a solicitor's or Doctors practice where a group of professionals will form an association.

Significantly, Handy (1991) used his own experience of working in a university to best illustrate this particular culture. He asserted that the independence, autonomy and job security enhanced the role of professors from their own point of view, but at the same time made them difficult to manage. Similarly, the wishes of the leader in this situation can be difficult to enforce as sanctions are difficult to apply and the Head of department does not normally determine reward packages. Consequently academics, according to Handy (1991), are managed with their approval and co-

operation, rather than with the position power of the organisation, and naturally this could constitute a barrier to sharing knowledge and to any changes in structure and culture that may be deemed necessary. A similarity with the person culture also exists in the university environment because control systems are indeed by mutual consent (Cronin, 2001).

3.3.4 Understanding Culture

The cultural web (Johnson and Scholes, 2011) is a development of Stein's ideas and acts as a framework for understanding the culture of an organisation by summarising the manifestations of artefacts which surround the paradigm. The web can help '….predict likely areas of resistance by assessing which are the strongest beliefs and how they interconnect with other elements of the web' (Heracleous 1995:5). In other words, by studying artefacts, it can be used to map existing culture and also the projected culture once organisational change has taken place thus enabling gap analysis to take place.

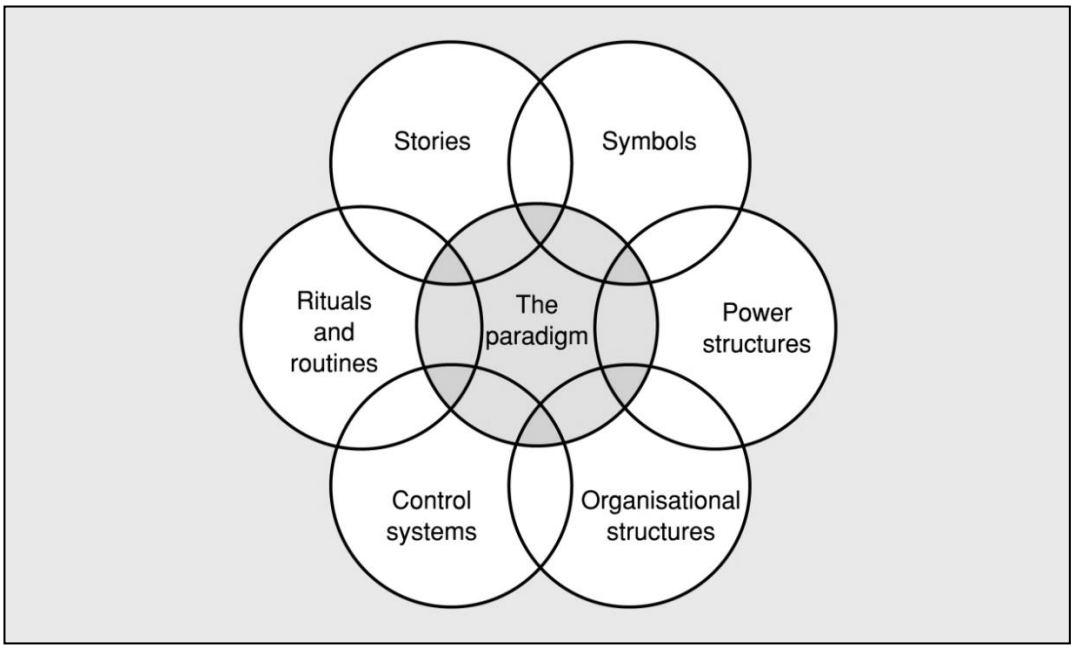

Figure 3.2: The Cultural Web

Source: Johnson, Scholes and Whittington (2011:176)

Stories- These are told by members to new recruits celebrating hero's personal achievement and excellence and illustrate what is important in organisation. In a university these could be for example about academic achievement or more negatively about government interference.

Symbols- The can convey meaning about an organisation and can relate to size of office, the value of titles (Professor for example), corporate logo and the design of building whether spacious and open (which in earlier discussion were found to be supportive of knowledge sharing) or less open and divided into one-person offices.

Power structures- These constitute the most powerful groupings and are likely to be associated with core values and beliefs of organisation. Clearly, within a university this would be widely perceived to be with the Vice Chancellor and Heads of Faculty but other groupings may have the ability to block change, such as those with technical knowledge or financial experts.

Organisational structures- These are discussed in detail during the course of this chapter and the configuration, whether centralised or decentralised will have a profound impact on any change and may itself be altered to enable that process.

Control systems- These are concerned with what is monitored. For example, is finance more important than other considerations, such as in a university the quality of teaching and academic standards? A balanced scorecard may be utilised to mitigate the tendency for other considerations to be subservient to financial considerations.

Rituals and Routines- These relate for example to meetings and ceremonies, such as might be arranged for new inductees or

employees. A university ritual would be an annual graduation ceremony, or even an informal regular meeting of a community of practice. Theses align closely with the artefacts described in Stein's model (1985).

The preceding components of the web mirror the table of artefacts in section 3.3.2. For example, rituals and routines are shown in the behavioural manifestations section as ceremonies and rituals. Also, control systems are closely linked with rewards and punishments. Different types of symbols appear in the physical manifestations section and stories feature in the verbal manifestations section.

The **paradigm** lies at the centre of the web and draws on all other components to create its essence which, as with Schein's model, are the basic taken for granted assumptions gained through shared experience that can guide organisational members (Johnson et al. 2011). The web has been used by organisations to attempt to effect paradigm change. This can be achieved by performing an audit of existing culture and constructing two webs representing existing and desired culture (Johnson et al. 2011). The web could thus be utilised to move to culture that supports knowledge sharing.

3.3.5 National Culture

According to Pauleen (2007:8) national culture is inextricably linked to organisational culture since employees '…bring their own societal culture in the form of customs and language' which can influence the attitudes and values of existing employees. National culture has also been defined as a sub culture and its importance in knowledge sharing is highlighted by Roberts (2000:430) who suggested that that more effort and a high level of face-to-face contact is necessary so that a '…. common social and cultural base' can be constructed.

Different classifications of national culture have been attempted but the most significant has been that of Hofstede (1986) who proposed the following five dimensions of national culture.

Power distance: measures the degree to which less powerful members of organisations and institutions accept the fact that power is not distributed equally

Uncertainty avoidance: measures the extent to which people feel threatened by ambiguous situations and have created institutions and beliefs for minimizing or avoiding those uncertainties. High uncertainty countries are United States and Australia and examples of countries uncomfortable with uncertainty are Spain and Argentina

Individual/collectivism: Individualist societies such as the United States and UK stress individual responsibility and success, whereas collectivist societies, such as those in South America and Asia stress loyalty to group in return for support.

Masculinity/femininity: Masculine societies such a Japan and Italy show assertive behavior, but feminine societies such as Sweden and Denmark demonstrate more modest behavior.

Long-term/short-term orientation: High Long Term Orientation societies such as China and Taiwan tend to value rewards that will come far into the future. Societies scoring low in this dimension such as UK, United States and Australia value the past and the present, a respect for tradition,

3.3.6 Leadership

Northouse (2013) defined leadership as '…a process whereby an individual influences a group of individuals to achieve a common goal' but has also been defined as a person and position (Bratton et al. 2004). According to Doppelt (2003) leaders play a key role demolishing barriers to change ingrained in organisational culture and can drive forward a new vision of the future. Schein (1992) also established the critical importance of the leader in shaping the organisational culture of an organisation. Significantly, empowering leadership has been strongly linked with knowledge sharing (Bartol and Locke, 2006), and Bryant (2003) argued that leadership supplies the motivation, visions, systems and manages the critical knowledge sharing process.

Leadership Theories

The earliest leadership theories focussed on traits that certain individuals possessed that could explain their ability to lead. Although it was possible to list common traits, the problem with this approach was it's that leaders that excelled in the context of one company could equally fail in another (Boddy, 2005).

Contingency models addressed this drawback by suggesting that leaders can adapt their style to the context of the company. Contingency models normally suggest a continuum of styles such as Vroom and Yetton's model (1973), which identifies the following styles:

- Autocratic
- Information seeking
- Consulting
- Negotiating
- Group

The model has been criticised due to the lack of social interaction amongst those who are making the decisions (Tjosvold, 1986), thus the level of sharing knowledge would be negatively affected.

Charismatic and transformational leadership have also been much discussed in recent years due to their perceived role as change agents. Qualities for charismatic leaders have been identified by researchers and in this way the charismatic approach mirrors the trait approach. Typical characteristics identified are a desire to influence, self-confidence and strong moral values, whilst behaviours are typically strong goal articulation, the communication of high expectations and strong role model (Northouse, 2013).

Transformational leadership builds on the idea of charismatic leaders in that they possess charisma but in addition they are able to inspire followers, provide intellectual stimulation, and give individual support and encouragement to followers who are motivated to put the interests of the company above their own personal interest (Bass, 1985). Yukl (1999) also drew attention to how transformational and charismatic leadership stressed emotions and values and noted that transformational leadership was associated with factors such as such as increased subordinate satisfaction, motivation and performance. In contrast with transformational leadership, transactional leadership concerns the exchange of reward such as increased salaries and promotion. Clear expectations are communicated to the employees and constructive feedback given when necessary Vera and Crossan (2004). Bass and Avolio (1989) also highlighted laissez faire leadership as an absence of leadership or extreme form of passive leadership. According to Bass (1985) transactional and transformational leadership styles could be seen as distinctive facets where a leader can be both transformational and transactional at the same time rather than at opposing ends of a continuum. Yukl (1999) noted that transformational leadership was associated with factors such as such as increased subordinate satisfaction, motivation and performance.

3.3.7 Organisational Structure

According to Huczynski and Buchanan (2010) the rational for an organisational structure itself is to divide and allocate the activities of organisations, then control and co-ordinate these activities in pursuit of the organisational purpose. They highlight Specialisation, Hierarchy, Span-of-control, Chain-of-command, Departmentalisation, Formalisation, Specialisation and Centralisation as the building key variables of structure.

Structural Forms

Hatch and Cunliffe (2006) identified the characteristics of five structural types: Functional, Multidivisional, Matrix, Hybrid and Network. A functional structure divides the organisation by specialist departments such as Marketing, Accounts and Operations. Responsibilities are clearly defined and within the functions there can be close relationships. However, co-ordination between functional groupings can sometimes be problematical and Lam (1996) was in no doubt that a structure separated into different functions inhibits knowledge sharing. Multidivisional structures consist of a collection of separate functional structures. This is typical of larger organisations and groupings can be created on the basis of products groups or geographical territories. Coordination between groups is provided by the headquarters (Hatch and Cunliffe, 2006). Johnson, Scholes and Whittington (2011) pointed out the dangers of fragmentation with this structure and again consider that this impedes knowledge sharing.

In contrast the matrix structure is a combination of functional and divisional structures and employees may report to two managers in different sections, typically a functional manager and project manager. Although this can lead to conflict due to competing demands (Hatch and Cunliffe, 2006) there is an increase in accessibility to different social networks for employees and this will serve to improve horizontal knowledge sharing (Cummings, 2004).

The network structure is relatively new and accentuates lateral rather than horizontal communication. Groupings within the company are characterised by partnership and collaboration and on the whole knowledge sharing and innovation are encouraged (Hatch and Cunliffe, 2006).

Bureaucracies and Post-Bureaucracies

The dominant form of organisational form for the majority of the twentieth century has been the bureaucracy. Bureaucracies are typically exhibit functional specialism, a hierarchy of authority and normally possess a formal set of rules that employees are compelled to follow Knights and Willmott (2007). According to Knights and Willmott (2007:483), this type of structure is suitable in organisations that that are characterised by the prevalence of standard procedures such as '…mass producing cars and processing social security claims' claims. Pinchot and Pinchot (1996:47) pointed out that the '… self-direction and teamwork characteristics' of knowledge work do not sit well with the autocratic and standardising nature of the bureaucracy.

Heckscher summarised the characteristics of the bureaucratic and post-bureaucratic model in 1994.

Table 3.2: Bureaucratic and post-bureaucratic models

Bureaucracy	**Post-Bureaucracy**
Consensus through acquiescence to authority	Consensus through institutional dialogue
Influence based on formal position	Influence through persuasion/personal qualities
Internal trust immaterial	High need for internal trust
Emphasis on rules and regulations	Emphasis on organisational mission
Information monopolised at top of hierarchy	Strategic information shared in organisation
Focus on rules for conduct	Focus on principles guiding action
Fixed (and clear) decision making process	Fluid/flexible decision making process

Communal spirit/friendship groupings	Network of specialised functional relationships
Hierarchical appraisal	Open and visible peer review process
Definite and impermeable boundaries	Open and permeable boundaries
Objective rules to ensure equity of treatment	Broad public standards of performance
Expectation of constancy	Expectation of change

Source: Heckscher (1994)

Clearly, characteristics such as the focus on trust, the sharing of strategic information the network of relationships and open boundaries are favourable to knowledge sharing and management in the post-bureaucratic model whereas the hoarding of information at the apex of the organisation coupled with the inconsequence of trust can only be a disincentive to sharing knowledge. In addition, the bureaucratic form was also no longer considered to be fit for the purpose due to the development of fast-moving markets and an intensification of competition due to its rigidity and lack of responsiveness (Morris and Farrell, 2007). Post bureaucracies are also credited with the ability to engender high performance flexible workforces able to adapt to change, and more importantly for knowledge sharing establish lateral rather than top down communication (Applebaum et al. 2000; Tucker, 1999).

Accordingly, a post bureaucratic organisational paradigm featuring flatter structures and decentralised control developed in the 1990's. The recommended way to achieve this fundamental change was achieved by the delayering and downsizing and many organisation followed this path throughout the 1990's and the process is still continuing today (Peters, 1992: Handy, 1995). This model began to replace the bureaucratic hierarchical form that typically contained different divisions and a high degree of central control (Morris and Farrell, 2007). Naturally this reduced the disincentive

effects of formalisation and centralisation on sharing knowledge (Willem and Buelens, 2005).

Lam (2005) argued that professional bureaucracies are characterised by a high level of individual autonomy and high standardisation of knowledge and work. Despite this high degree of autonomy, Lam (2005) suggested that organisations such as this derive their bureaucratic nature to standards that define process. These can be also externally imposed as in education. Individual professionals:

> …are the key knowledge agents whose formal training and professional affiliations give them a source of authority and a repertoire of knowledge ready to apply.

Members of professional bureaucracies can also identify strongly with professional rather than organisational values (Lam and Lambermont-Ford, 2010). Employees in such organisations need to consider if they should amass knowledge to help their own career or disclose it for the benefit of the organisation (Lam and Lambermont-Ford, 2010).

3.6.3 Mechanistic and Organic Organisations

The change in organisational structure can also be considered in mechanistic and organic terms. Applebaum (1997) summed up the characteristics of both types of structures in the table below.

Table 3.3: Characteristics of mechanistic and organic structures

Characteristics of mechanistic structures	***Characteristics of organic structures***
Highly specialized and separate jobs Jobs pursued as distinct from company as a whole Co-ordination by hierarchic supervisory authority Precise definitions of rights and responsibilities Responsibility and commitment attached only to a single job Hierarchic control, authority and communication Knowledge focused at top of hierarchy Primary vertical interaction Work behaviour governed by superiors' communications Insistence on loyalty and obedience Local, company knowledge and experience most important	Individuals contributing as appropriate to overall goals Jobs relating directly to company's current situation Co-ordination by mutual adjustment Wide sharing of responsibility for outcomes Responsibility and commitment to company as a whole Network structure with pressure to serve the common interest Knowledge located anywhere, creating its own centre of authority Lateral communication flow resembling consultation Communications in the form of information and advice Commitment to company goals valued over loyalty and obedience Knowledge and experience from wider professional and important industry arena most important

Source: Applebaum (1997)

The mechanistic organisation clearly displays many characteristics of the bureaucratic model such as the hierarchical aspect, vertical nature of communication and concentration of knowledge in the top of the organisation. Such characteristics can again be considered a disincentive to knowledge sharing. Conversely the network structure, lateral communication and importance attached to affiliations can be considered enablers to knowledge sharing.

Burns and Stalker (1961) argue that neither organisational structure is an absolute ideal form. Instead they suggest that the structure adopted should match the environment of the business. Thus a mechanistic structure would be suited to a stable environment where the pace of technological change is

slow, and an organic one suited to fast-paced rapidly changing environments involving rapid changes in technology. Consequently, organisational structure is contingent on the environment.

3.4 Individual Context

3.4.1 Theory of Reasoned Action

Employees cannot be compelled to share their knowledge so organisations have to consider what factors motivate employees to share. One significant theory that has been used by researchers interested in such factors is the Theory of Reasoned Action (TRA), shown below in Figure 3, which suggested that a decision to implement a particular behaviour can be predicted by intention (Fishbein and Ajzen, 1975). The intention is determined by attitude (which mirror individual beliefs) and subjective norm (which is affected by normative beliefs and motivation to comply with beliefs). TRA has been widely employed to study knowledge sharing behavior (Bock and Kim, 2002; Bock *et al.* 2005; Lin, 2007).

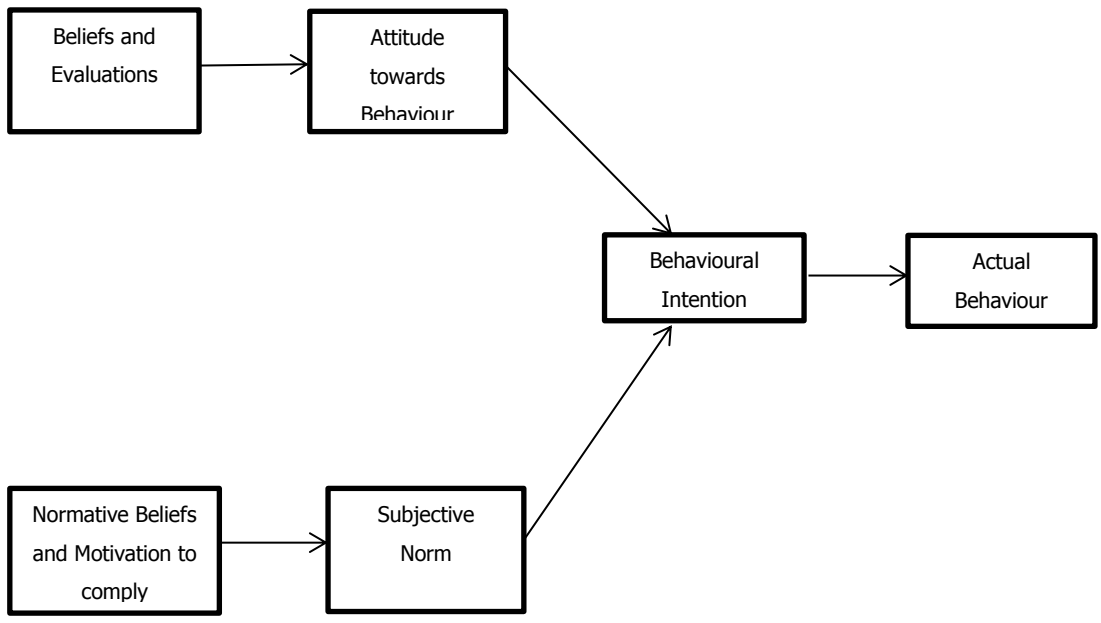

Figure 3.3: Theory of Reasoned Action
Source: Fishbein and Ajzen (1975)

3.4.2 Social Capital

Both social exchange and social capital theories have been prominent in research into knowledge sharing and are closely related with discourses on organisational trust. Social capital has been defined as '….a valuable resource for the conduct of social affairs providing their members with ….a credential' (Nahapiet and Ghoshal, 1998:243). Similarly, Hislop (2009) and Leana and Van Buren (1999) defined social capital as the advantages and resources gained through status and a network of personal relationships. Blau (1964) suggested that knowledge could be perceived as a valuable resource to be exchanged and a calculation of benefits and costs is made before a decision on whether or not to share knowledge is made. If benefits exceed costs the knowledge sharing behaviour will continue. Bordia et al. (2006) pointed out that costs may encompass time, mental exertion and losing competitive advantage, whilst benefits may include obligation to reciprocate, recognised rewards and enhanced reputation. When costs are evaluated as too high this may lead to evaluation apprehension and act as a constraint on knowledge sharing (Bordia et al. 2006)

According to Radaelli et al. (2011) the strong relationship between social capital and reciprocity may affect the calculation of the benefits of knowledge sharing by an employee, and equally stronger connections built up over a period of time will lead to more reciprocal influence. Granovetter (1985) suggested that individuals value the knowledge and information gained from others they have dealt with in the past more than any other form. This is because it is inexpensive, can be trusted and '... is from someone who has an economic motive to be trustworthy so as not to discourage future transactions'. Granovetter (1985) also pointed out that the continuing social content within the relationship encourages further trust. Hislop (2009) suggested that a stock of social capital is advantageous for knowledge workers because it will enable them to access the knowledge that is important to them to perform their roles with their organisation. Three dimensions of social capital are highlighted by Nahapiet and Ghoshal (1998):

Table 3.4: The Three Dimensions of Social Capital

Dimension	***Character***
Structural	Network Ties Network configuration Appropriable organisation
Relational	Trust Norms Obligations Identification
Cognitive	Shared codes and languages Shared narratives

Source: Adapted from Nahapiet and Ghoshal (1998:251)

The relational aspect refers to the degree to which the person exchanging knowledge is known and important determinant factors are '….friendship, sociability, approval and prestige'. Personal and emotional attachments may also persuade a colleague to remain in a department in spite of economic advantages offered by a move to another workplace (Nahapiet and Ghoshal, 1998, p 53). However Willem and Buelens (2007) found in their study of two contrasting Belgian organisations that social capital was used in an instrumental way to achieve personal aims and gain resources, and knowledge sharing was a side effect of this process.

Status is an important component of social capital (Lin, 1999) and Thomas-Hunt et al. (2003) recognised that group members consider the abilities of group members in terms of the task in hand, which in turn leads to differences in perceptions of status. They identified expertise effects, social ties, and the overlap of social and informational ties as variables of status. Connelly and Kelloway (2003) suggested that status distinctions may be reduced if management proved willing to share knowledge freely in impromptu meetings with employees.

According to Wasko and Faraj (2005) it has been argued that social capital is less likely to accrue in electronic networks because of the tacit and

embedded nature of some knowledge. This assertion could certainly have ramifications for academics attempting to share knowledge with others within the same discipline in a virtual environment and also if face-to-face contact was becoming less common within the department itself.

Bock and Kim (2002) emphasises the role of both economic and social exchange in knowledge sharing. Economic exchange involves participant calculating in a rational way what benefits and costs may occur as a result of sharing, and this process will take place only if rewards exceed costs. Thus extrinsic benefits are emphasised in economic exchange theory as motivators towards sharing (Bock and Kim, 2002). Maintenance of power can form part of this calculation and Disterer (2001) also pointed out that hoarding can be caused by experts guarding their exclusive knowledge, and that this can particularly be the case when perceptions of job security are low.

Social capital theory is also linked to intrinsic motivation by Bock and Kim (2002). The central theme in this case is self-efficacy which is defined by Bandura (: 193, 1977) as '….the conviction that one can successfully execute the behaviour to produce the outcomes', thus self-efficacy can be judged by the degree of confidence a person has in their own ability. Bock and Kim (2002) suggested that the amount of confidence an employee has that their knowledge sharing behaviour will make a contribution to organisational performance is a significant factor affecting knowledge sharing behaviour and feelings of self-worth.

Emerson (1976) summed up social exchange theory as ...' a frame of reference that takes the movement of valued things (resources) through social process as its focus.' Bock and Kim (2002) stressed the contrast with economic exchange theory in that intrinsic rather that extrinsic reward are emphasised, and these take more intangible forms such as feelings of obligation and trust. Self-interest is naturally part of any inward calculation of cost and benefit. Knowledge enables employees to differentiate

themselves from others and they may wish to engineer situations where knowledge is obtained without being given (Samieh and Wahba, 2007).

Constant, Kiesler and Sproule (1994) found that employee perceptions of ownership of knowledge affected knowledge sharing attitudes in that they give more weight to the social good aspect of sharing when their knowledge has been obtained through experience and training at work. Jarvenpaa and Staples (2001) discovered that elements of organisational culture such as solidarity and need for achievement were linked to beliefs concerning ownership.

Homophily is a further factor that has been investigated in relation to its effect on sharing knowledge. According to McPherson, Smith-Lovin and Cook (2001:415) this refers to '... the principle that a contact between similar people occurs at a higher rate than among dissimilar people', and has been established by multiple research studies. Clearly, this may be a significant factor in networking activities, which knowledge is shared with and also in the formation of friendship groups and communities of practice.

3.4.3 Communities of Practice

This term was first used by Lave and Wenger (1991) when discussing learning by apprenticeship and Hislop (2009) made clear the importance of communities of practice by suggesting that they are the second most important concept in knowledge management literature, and relates the concept to the practice based perspective on knowledge and the perceived collective nature of nearly every type of work. Wenger and Snyder (2000) conceptualised such communities as a supplement to existing organisational culture. According to Archichvili (et al. 2003) they can also deliver competitive advantage because of their role in acting as a vehicle for sharing tacit knowledge.

Communities of practice have been defined by Pan and Scarbrough (1999: 364) as '….the small groups of people who have mutual respect, share some common values and generally get the important work done', and by Brown and Duguid (1998) as developing '….a shared understanding of what it does, of how to do it, and how it relates to other communities of practice-in all, a *world view'*. The emergence of such communities is a natural process owing much to the social context of activities at work (Brown and Duguid, 1991). Hislop (2009) similarly believes that all communities of practice contain '…. a body of common knowledge, a sense of shared identity and some common or overlapping values'.

Wenger and Snyder (2000) suggested that they can be nurtured by creating conditions and bringing people together but are resistant to supervision and are consequently sometimes viewed with suspicion by organisations particularly as they do not figure on the formal organisational chart. They can be recognised by a shared understanding and passion that leads them to ask for advice and share knowledge not with their formal work group but within the community of practice itself (Hislop, 2009).

The communities themselves in contrast to formal work groups are subject to constantly changing learning and sharing environment with core members with other members joining and leaving when they feel inclined to do so (Swan et al. 2002). Klein et al. (2004) has attempted to classify communities of practice in two ways. First of all communities may be stratified where members may be treated differently depending on their grade or expertise, or egalitarian where differences in expertise may be minimised, as in a community consisting of research professors and students. A further classification divides communities into knowledge sharing and knowledge nurturing

Wenger and Snyder (2000) highlighted a number of advantages for companies who see the value of such communities. Problems can quickly be solved because members know where to seek advice. In addition best

practices can be transferred between members who may come from different departments within an organisation. Professional development may benefit from the formation of communities that meet up outside a formal training and development structure, and staff may also be attracted by the prospect of belonging to prestigious community of practice. Dixon (2000) pointed out that employees who would not be disposed to share information on a database would readily share tacit knowledge with a colleague informally, whereas Swan et al. (2002) highlighted the spontaneity and freedom of expression that communities of practice afford to their members.

The loss of key members can adversely affect communities as they are by their very nature transient Swan et al. (2002), and leadership needs to be in evidence for the group to survive. Resentment can occur if the community of practice is perceived by others as an exclusive club for favoured individuals (Pemberton, Mavin and Stalker, 2007) and this highlight the problem with using prestigious communities of practice as recruiting tools as advocated by Wenger and Snyder (2000).

Swan et al. (2002) were concerned about the limitation on knowledge flows across the organisation as a whole which could act as a constraint on the creation of innovations that are would not be developed by one community in isolation. Furthermore, Harris (1980 as cited in Swan et al. 2002) points out that organisations cannot always be viewed as a *community of communities* visualised by Brown and Duguid (1991) because some communities are concern the primary social practices surrounding the construction of goods and services and some communities are concerned with the co-ordination activities of those primary social practices.

Communities of practice, formal work groups, teams, and informal networks are useful in complementary ways. Below is a summary of their characteristics when compared with other formal and informal work groupings. Clearly, it is the passion, commitment and the desire to share

knowledge that sets communities of practice apart from the other groupings Wenger et al. (2002). As in an informal network, members are not assigned by management but the informal network does not aspire to develop its members beyond the needs of the immediate task (Wasko and Faraj, 2000).

Table 3.5: A Snapshot Comparison

	What's the purpose?	**Who belongs?**	**What holds it together?**	**How long does it last?**
Community of practice	To develop members' capabilities; to build and exchange knowledge	Members who select themselves	Passion, commitment, and identification with the group's expertise	As long as there is interest in maintaining the group
Formal work group	To deliver a product or service	Everyone who reports to the group's manager	Job requirements and common goals	Until the next reorganisation
Project team	To accomplish a specified task	Employees assigned by senior management	The project's milestones and goals	Until the project has been completed
Informal network	To collect and pass on business information	Friends and business acquaintances	Mutual needs	As long as people have a reason to connect

Source: Wenger and Snyder (2000:142).

As more organisations have embraced the concept of communities of practice the issue of geographically dispersed communities within multinational companies in particular has arisen. Research by at Caterpillar by Ardichvili et al. (2003) suggested that in addition to previously discussed issues such as trust, confidentiality of communication within the group was an important consideration and sharing between group members led to a decline in their utilisation of the formal knowledge network. In addition,

some members of the community were not replying to posting on the official knowledge network because an incorrect answer might damage the reputation of the community. Networks that became virtual after face-to-face socialisation also naturally seemed to be more successful because a degree of trust had been established. Ardichvili et al. (2003) argued that institution–based trust, where participants knew that members of the institution could be trusted, would be an important component in virtual communities that have no prior knowledge of each other.

Hislop (2009) pointed out that communities of practice can have an important link with the organisational knowledge base and organisational learning. Communities can be conceptualised as possessing localised knowledge within an organisation, however this knowledge can overlap into different communities, thus there is a body of knowledge common to the organisation in most communities. Brown and Duguid (1998) considered that the knowledge base in turn would be affected by the organisational structure of an organisation, such as by product, function or geography. Indeed, Lam (1996) suggested that a functional structure would inhibit sharing across communities of practice.

Although they are presented here as individual activities, the success of communities of practice is influenced by organisational context factors such as the presence of a knowledge sharing culture and a leader that encourages knowledge sharing practices (Delong and Fahey, 2000). Thus they are a powerful tool for sharing knowledge, although members still need to be motivated to share and confident about the efficacy of their own contribution.

3.5 Key factors affecting knowledge sharing

The theoretical context of critical organisational and individual factors affecting knowledge sharing in has been discussed in the preceding sections. Research into the effect of these factors on knowledge sharing behaviours will now be discussed along with other factors supported in the literature (Wang and Noe, 2010; Riege, 2005).

3.5.1 Culture

The significance of organisational values being aligned with a knowledge sharing culture is affirmed by Alavi *et al.* (2006, p196) who proposed that a more "….open and supportive value orientations" would encourage greater sharing of knowledge. The positive effect of a supportive culture on knowledge sharing behaviour has been widely affirmed (Al-Alawi et al. 2007; Connelly and Kelloway, 2003).

De Long and Fahey (2000) proposed the following four frameworks where culture can be associated with knowledge sharing behaviours. Indeed they considered that a discussion of knowledge that failed to consider culture was fruitless.

1. Culture shapes assumptions about which knowledge is important

Different types of knowledge are important in different companies depending on processes used to produce the product or service. Norms and routines may be rooted in bureaucratic procedures such as accounting for time spent and this could be a barrier to knowledge sharing

Managerial actions should be directed at clarifying existing norms such as whether the culture is to share information between divisions and if that was the case what difference would it make to those managers actions.

2. Culture mediates the relationships between levels of knowledge

Culture personifies understood norms about how knowledge is disseminated within the organisation. It can influence whether knowledge belongs to individuals or organisations and the how individuals would feel if their knowledge was for example added to the organisational intranet.

3. Culture creates a context for social interaction

Norms and values can clearly affect how for example employees react to mangers and others in authority. These can determine how approachable those in authority can be, and a lack of this approachability can dissuade employees from sharing knowledge with those in authority. Formal and informal communication processes may also be valued differently.

4. Culture shapes creation and adoption of new knowledge

In particular relationships between subcultures can decide whether a company for example adopts a new product or shares knowledge with a partner company.

McDermott and O'Dell (2001) also asserted that corporate culture is an essential component of a successful programme of knowledge management. In their view it is possible to change the culture to fit the knowledge management initiative or adapt the initiative to fit the culture. In either case the importance of understanding culture is undeniable. Liebowicz (2008) suggested that any knowledge management initiatives should try to match the existing culture because of the amount of time changing the culture can take.

A study by Alavi *et al.* (2006) concluded that standardised knowledge tools would be applied differently because of varying cultural values within organisations. In addition they suggested that a bottom up and top-down

intervention could be applied simultaneously within the same company because of the varying cultural values present. Consequently, knowledge sharing initiatives should appeal to a wide range of cultures within an organisation and technology should also be accessible to different groups.

The role of subcultures can be highly significant as these involve subsets of values that can be applied to different groupings in the organisation such as divisions and departments. Different groups will have a different view about which knowledge is important within the organisation of that can support. De Long and Fahey (2000) therefore recommended that some effort is invested in discovering the nature of subcultures, for example whether bureaucratic or more open in nature.

National Culture

Griffiths *et al.* (2006) in study of United states and Japanese organisations found those from the United States exhibited individualist tendencies, less tolerance of an unequal distribution of power, more feminine characteristics and a short term orientation. The result of this according to Griffiths *et al.* (2006) is a disposition to minimise social contact and reliance on others and trust others less. Clearly some of these characteristics would restrict knowledge sharing behaviour and the effects of trust are fully discussed in the subsequent section. Given that the UK is classified in a similar way to the United States then these conclusions would be have some validity in the UK. Furthermore, Bhagat et al. (2002) argued that societies handle knowledge in different way with individualist societies favouring explicit knowledge and collective societies favouring tacit knowledge.

On a similar theme, one critique of Nonaka's SECI model, discussed in chapter 2, has suggested that is more relevant to the high context Japanese cultural setting where there is a greater degree of collaboration and networking between employees and organisations (Glisby and Holden, 2003).

3.5.2 Leadership

Politis (2001) analysed the relationship of leadership styles to knowledge management by measuring knowledge acquisition attributes of each style, He concluded that a participative rather that autocratic style supports knowledge acquisition. Empowered workers naturally have higher degree of autonomy and Srivastava, Bartol, and Locke (2006) suggested that such employees look for answers to tasks they have been set and in the process more readily work as team and share knowledge with each other. Thus an empowering style of leadership encourages knowledge sharing. In addition those leaders that showed a high concern for production rather than people were negatively associated with dimensions of knowledge acquisition.

Oliver and Kandadi, (2006) collected research evidence from employees that suggested developing a knowledge culture required leaders to be empowering, open to change, forbearance of mistakes, engendering trust and developing a long term perspective. Significantly, this view applied also to the attributes front line and middle managers as well as senior and top managers.

Both transactional and transformational styles were positively associated with knowledge sharing by Politis (2001). However a study by Crawford (2005) suggested that knowledge management is not improved by transactional leadership and is impeded by a laissez-faire style, whereas a robust association exists between transformational leadership and knowledge management behaviours. Crawford (2005) concluded that transformational leaders are therefore more probable to engage in knowledge management activities as they move further up the organisational hierarchy. Bryant (2003) was also positive about the role of transformational leaders in encouraging a knowledge sharing culture. Although a close relationship between goals and rewards in transactional leadership was postulated as an inhibitor to sharing and creativity (Bryant, 2003)

Connelly and Kelloway (2003) also pointed to a strong link between transformational leadership and knowledge sharing and this was highly consistent with the findings of Crawford (2005) and Bryant (2003). Furthermore they indicated that employees make an assessment about the strength of management support for knowledge sharing by seeking symbols, such as a promise of resources to provide knowledge sharing technology.

3.5.3 Organisational Structure

Willem and Buelens (2005) focussed on the impact of particular structural co-ordinating mechanisms on knowledge sharing activities. They felt that centralisation was a disincentive to knowledge sharing because of the control exerted by top managers who in any case needed to be clear on which knowledge was important and who was in possession of such knowledge. This was also supported by research by Kim and Lee (2006).

Similarly formalisation was also considered not conducive to sharing knowledge because of the control aspect and a lack of flexibility. In contrast informal coordination was thought to have strong positive effect on knowledge sharing in part because of it encouraged an atmosphere of trust (Willem and Buelens, 2005) and this supports the case for the development of communities of practice discussed later in this chapter. Nonaka (1995) also emphasised the critical importance of horizontal rather than vertical coordination in enabling sharing. In terms of specialisation, an increasing degree of complexity resulted in knowledge becoming more tacit in character and more difficult to diffuse (Willem and Buelens, 2005).

However, Reagans and McEvily (2003) found that that network structures such as promoted sharing of both tacit and explicit knowledge because of the strength of connection between participants facilitated by this type of structure, and that strength of social cohesion (where costs of sharing knowledge are minimised) supported this process. Specifically, Cummings (2004) discovered that in a matrix structure where employees report to more

than one manager, knowledge sharing was enhanced. However research by Willem and Scarbrough (2006) did point to a tendency for some employees to use networks in a political way to accentuate the quality of their own knowledge as source of power but not to share it.

3.6.4 Physical Structure

Structure, design and location of office accommodation can also play a part in knowledge sharing characteristics in addition to organisational structure. Sole and Edmondson (2001) felt that employees in physical proximity of each other, perhaps in the same office or corridor, are more likely to share knowledge, particularly that which is relevant to their own expertise . Oliver and Kandadi (2006) also noted how shared areas and informal areas where employees can meet up can assist networking.

Sole and Edmondson (2001) also commented on how close geographical proximity influences the organisational culture of a particular location and belonging to a geographical sub-unit can engender a distinctive social identity.

3.6.5 Communities of Practice

Hildreth and Kimble (2004) conducted research on the formation and growth of a community of practice known as ActKM in the public sector in Australia. They believed that the community developed quickly because of members were keen to discuss their work experiences but not through formal hierarchical channels. The core team of two members remained throughout the period described by the research and were able to nurture and encourage other members. Apart from this, membership was dynamic with trusted colleagues posting initially online forums and then becoming more of an active participant after discussion with core members. On occasions debates became personal and some members became concerned but the passion generated by both sides of the academic argument was deemed eventually to be good thing, and other such debates were viewed as

promoting more vigorous debate. Regular face-to face meetings were considered critical for relationship building in a community that conducted much of its debate online. Characteristics displayed by this community such as the shared identity and interests of members, nurturing leadership and transient nature are widely supported in the literature (Brown and Duguid, 1991; Wenger and Snyder, 2000; Swan et al. 2002).

Strategy can also be driven by communities of practice as in World Bank where they were instrumental in creating knowledge bank for economic development, and are now funded by the bank. On the other hand, sponsoring communities of practice suggests that they have become institutionalised, and can also be managed. Yet according to Pemberton, Maven and Stalker (2007) where communities of practice have been sponsored by management, they may be required to demonstrate organisational conformity thus losing their inherent flexibility, spontaneity and freedom.

3.6.6 Organisational Rewards

Bock et al. (2005) suggested that personal belief structures and the likelihood of both organisational and individual rewards are crucial motivating factors in decisions on sharing knowledge. One outcome of Bock and Kim's earlier study of four large public organisations in South Korea (2002) was that there was a negative relationship between attitude to knowledge sharing and expected rewards. A later study conducted by Bock *et al.* (2005) yielded the same result with regard to anticipated extrinsic rewards and their conclusion was that '…. A felt need for extrinsic rewards may very well hinder rather than promote the development of favourable attitudes towards knowledge sharing'. Similarly, Gagne (2009) found that employees can believe tangible rewards to be associated with perceptions of controlled motivation and suggested that compensation systems should encourage feelings of autonomy and capability. These finding are contrary to the theory of economic exchange, however other studies support this theory. For

example Kim and Lee (2006) found in their survey of public and private organisations in South Korea that reward systems are positively associated with knowledge sharing.

A different picture emerged in the study conducted by Bock et al. in 2005 in when intrinsic rewards, such as forming relationships and taking pleasure from helping others, were under consideration. Anticipated reciprocal relationships were positively associated with more favourable attitudes towards knowledge sharing. In a survey amongst senior executives in Taiwan, Lin (2011) found that intrinsic and extrinsic motivation positively affected knowledge sharing practices, and that those employees who find enjoyment in sharing their knowledge assist the implementation of knowledge management. Apart from the enjoyment aspect Lin also established that extrinsic motivation is also necessary for knowledge sharing. Thus ...'employee perceptions of benefits may lead them to participate and contribute to the KM effort and influence subsequent KM evolution'.

However in a survey of large organisations in Taiwan, Lin (2006) discovered that expected rewards did not influence attitudes and intentions to share significantly. In contrast reciprocal benefits affected attitudes and intentions towards sharing knowledge as did the intrinsic motivation of the participants. The study also identified enjoyment in sharing and self-efficacy as linked with both attitude and intention to share. Finally, those with the most positive knowledge sharing intentions had the more positive attitudes towards sharing.

Research by Oliver and Kandadi (2006) indicated that long term rewards like share options and profit sharing were often viewed as more effective by employees and that many are not affected by organisational rewards, but may share knowledge because of intrinsic personality characteristics such as recognition. Bartol and Srivastava (2009) drew a distinction between knowledge contributions to databases and which were rewarded under

economic exchange theory and knowledge contribution in formal social interactions which could take place in team or departmental meetings and briefings. They pointed out that knowledge contributions to databases unlike those in a social context can be recorded and evaluated on an individual basis thus they believe that rewards will have a positive effect. In contrast, sharing in formal situations could be rewarded at individual, team or across team/work units where the organisation operates internationally. In this situation Bartol and Srivastava (2009) proposed that merit pay plans that recognised knowledge sharing would be effective, as would team-based rewards. Profit sharing plans would be appropriate for organisations covering international locations.

A further interaction is highlighted by Bartol and Srivastava (2009) is sharing in an informal situation which is often motivated by social exchange theory. They point out the difficulty in identifying incidences of informal knowledge sharing within a formal reward system, thus there is an issue of measurement. However, trust in the procedural justice and the fairness of the reward giver and rewards can inspire confidence and trust in systems. This would in turn lead to more pro-social activities such as knowledge sharing.

Communities of practice are identified by Bartol and Locke (2009) as a separate field of interaction with regard to rewards. Again they highlight the difficulties in allocating rewards in informal interactions and suggest that intrinsic rewards are the key to encouraging sharing in communities of practice. On a similar theme Hislop (2009) believed that some employees share knowledge because they simply find it intrinsically rewarding.

3.6.6 Organisational Trust

Trust has been broadly defined by Mayer *et al.* (1995) as the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other party will perform a particular action important to

the trustor'. Gilbert and Li-Ping Tang (1998:322) define organisational trust as the '... belief that an employer will be straightforward and will follow through on their commitments'. They discovered that age, marital status and the cohesiveness of groups of workers affected levels of trust. Gilbert and Li-Ping Tang (1998) suggested ways to address these problems such as relationship counselling and team building exercises. However, in an academic setting, teams are often in communication by virtual means so the trust needed to encourage knowledge sharing may be lacking. Davenport and Prusak (1998) affirmed the importance of organisational trust by suggesting it should be part of organisational culture so ensure that knowledge sharing takes place.

Mishra and Morrissey (1990) cited four factors that will encourage organisational trust:

- Empowering workers
- Allowing access to important information
- Communicating openly
- Showing how they feel about issues

Consequently, these could be used to test levels of organisational trust in organisations such as in a higher education setting. Organisational trust could naturally affect the propensity of employees to share information with those in authority within the organisation and as previously discussed, empowerment of workers leads to greater knowledge sharing. However, sharing with peers may be affected more profoundly by the level of interpersonal trust.

3.6.7 Interpersonal Trust

According to Hislop (2009) interpersonal trust has become a topic of much more interest in recent years due to its critical role in determining how much knowledge people are prepared to share with one another. Mollering et al. (2004) pointed out that that in a dynamic environment employees are taking on an ever-growing number of roles that can frequently change. They are also expected to challenge, innovate and share knowledge and without the mutual trust of colleagues and this can be an almost insurmountable task. Six and Sorge (2008) suggested that an atmosphere of trust can be promoted by a relationship-oriented culture, consistent induction training, the creation of informal meeting opportunities and managing competences.

During a study of the knowledge sharing behaviour of scientists, Andrews and Delahaye (2000) discovered that supposed trustworthiness was a critical aspect of knowledge sharing because a judgment had to be made about the integrity of the colleague, such as the chances of their work being copied. This linked with the awareness of the scientists of the commercial value of their knowledge and the overriding need for trust and confidence. Scientists also assessed '…personal style and status' of colleagues before deciding if a knowledge sharing situation could be established and were more concerned with the credibility of the person rather than the knowledge they possessed (Andrews and Delahaye, 2000:802)

According to Lin (2006), employees who are strongly committed to the organisation often through an emotional connection are more disposed to share their tacit knowledge in the belief that it will be appreciated and utilised to the advantage of the organisation. This is in addition to the level of cooperativeness that can be displayed by employees as traits. Lin (2006) suggested that management monitor to measure feelings amongst employees about the level of organisational justice within the organisation and take steps to improve the situation if necessary. He concluded that training and such sharing vehicles as focus groups can encourage the

exchange of tacit knowledge as can frequent communications between management and employees.

Situations where team members are geographically dispersed can present greater challenges in terms of trust. Handy (1995) suggested that face-to face meetings were even more necessary in this situation. Hislop (2009) suggests that in the light of the importance of trust, social relations between employees require deep consideration when trying to implement knowledge management initiatives.

3.6.8 Technology for Knowledge Sharing

The Role of Technology in the Objectivist Perspective

Earlier in this Chapter, the objectivist perspective was discussed and it was clear that a basic premise of this approach was that much knowledge was in explicit form or could easily be codified, thus the importance of ICT systems for knowledge sharing can be established (Hislop, 2009). Skyrme (1999) suggested that knowledge, once identified and created acquires value through codification, storage and diffusion and highlighted technologies that were appropriate at these different stages.

Table 3.6: Innovation Cycle

Process	***Technology***
Identify	Knowledge Discovery, Data Mining, Text Mining
Create	Thinking aids, Conceptual Mapping
Collect/Codify	Information Push, Search Engines, Intelligent agents
Knowledge Repository	Documents, Databases, Data Warehouse
Diffuse/Use	Decision Support, Groupware, Videoconferencing

Source: Adapted from Skyrme (1999:126)

The Role of Technology in the Practice Based Perspective

One important change to the knowledge sharing process enabled by ICT has been the variety of interfaces for knowledge exchange that have now been provided. Hislop (2009) listed the characteristics of the different forms of communication, and pointed out that there is some considerable debate about whether ICT mediated communications channels fails to facilitate the richness of interaction necessary for meaningful knowledge sharing because of the absence of social cues. On the other hand it is suggested that there can be a role for ICT mediated communication when in combination with face to face communication (Hislop, 2009).

It should also be kept in mind that utilisation of such channels of communication is in any case influenced by ease of use of information technology because user-friendly groupware and collaborative systems are much more likely to be used by employees. Attitudes of co-workers to technology and effectiveness of training and technical support are also critical factors in usage levels (Davis, 1989).

Table 3.7: Characteristics of various communication mediums

Medium	**Communication Characteristics**
Face to face	Information rich, social cues such as facial expression, voice, gesture, synchronous and suitable for high quality feedback
Video conferencing	Information rich (social cues and virtually real time)
Telephone	Intermediate information richness, tone of voice conveys some social cues but gestures invisible
E-mail	Suitable for sharing highly codified knowledge, relatively low information richness, Asynchronous, Permanent record generated, Development of trust based on email alone difficult

Source: Adapted from Hislop (2009:230)

However, Hislop (2009) pointed out that this hierarchical view of communication takes no account of contextual features within the organisation such as existing degree of understanding between participants, the desire to communicate and the competency and inclination to use different systems. Consequently, email may be the medium of choice in situations which may be more suited to a richer form of communication because it is familiar to users.

A further factor cited by Hislop (2009) is the organisational culture, which may be disposed to require a record of interactions, in which case email will predominate. However, in a culture where team working and openness are valued highly, face to face and telephone conversations may be preferred. In contrast, technology usage may be appropriate for shy employees and those who prefer to work alone (Connelly and Kelloway, 2003).

Individual characteristics embedded in the culture of the organisation can also affect use of technology. The critical importance of trust in the context of barriers to knowledge sharing has already been established earlier in the chapter, and in the table above, the development of trust is described as difficult in a situation where virtual communication is the only form of contact. According to Hislop (2009) a significant school of thought believes that trust through virtual communication is not possible, and although others saw evidence of trust developing in purely virtual teams this tended to be precarious in character (Mayer, Davis and Schoorman, 1995). Bordia et al. (2006) focussed on personality and suggested that highly extraverted employees are more likely to share knowledge in a face to face situation because of the personal relationship component involved.

3.6.9 Human Resources

Gloet (2006) suggested that the change in focus of HR away from the historic personnel management role to a more strategic focus on business functions should include knowledge management. She asserted that '….in

the knowledge economy the prime focus of HRM should be the development of human capital and the management of knowledge'. The role of HRM should therefore be that of an enabler in terms of promoting individual, team and organisational learning. Communities of practice should therefore be facilitated and human capital managed through employee development practices.

Selection methods, Compensation Strategies and Career Systems are the three aspects of HRM emphasised by Scarbrough (2003) in relation to knowledge flows and innovation. Selection methods can influence the success of project teams in terms of the skills and attitudes required to process knowledge. Rewards for knowledge sharing are desirable but can be divisive therefore Scarbrough draws attention to the fact that reward systems should be innovative and not reward knowledge sharing processes explicitly. Finally, career systems can impact on knowledge sharing practices and the promotion of high achieving individuals into an 'expert' position instead of into the management hierarchy is recommended. Continuous professional development that keeps knowledge up to date that can be facilitated by HRM has also been cited by Edvardsson (2007) as crucial to the development of knowledge workers. Linkage of these factors to business strategy can ensure an excellent fit of skills and behaviours with the knowledge development process for innovation. Gloet (2006) suggest that a further role for HRM is to identify capabilities that help sustain the organisation and develop these through learning support and rapid promotion of individuals, which will also link into the performance management system.

More detailed suggestions are provided by Oltra (2005) such as including a knowledge management component in job descriptions and the planning of tasks. Edvardsson (2007) also pointed out the importance of an integrated performance management system as difficulties can arise when functions set conflicting objectives. According to Minbaeva et al. (2012) if the concept of

knowledge sharing is a key aim of the organisation, it should figure in performance management, training and development systems and also reward systems. Gagne (2009) developed this theme by suggesting that performance management schemes should concentrate on providing a context that encourages autonomous motivation rather than using techniques such as evaluation, deadlines and tangible rewards.

The table below emphasises the probable difference between practices and behaviours in a codification and personalisation strategy (Hansen *et al.* 1999). Cultural fit, longer term goals and all round development are emphasised where the sharing of tacit knowledge is important.

Table 3.8: KM strategies and HRM practices

KM strategy	***Codification of explicit knowledge***	***Personalisation of tacit knowledge***
HRM Practices Recruitment	Psychometric testing, job descriptions electronic recruitment	Fit into knowledge sharing culture, personal recruitment
Reward	Varied rewards for people for documenting knowledge, following standard routines, using technology, volume of data	Varied rewards to people for sharing knowledge, developing new ideas, creative failures, quality of data
Performance management (control)	Hard objectives, result-oriented, short-term, functionally specific goals	Developmental objectives 360´evaluation, group-orientation, long-term
Training	At start, specific skills, Implementer mentality. Single loop learning	Ongoing, broad skills, inventor mentality. Double loop learning
Desired behavioural outcome	Documenting knowledge, low risk-taking, specialisation, effectiveness	Risk-taking, exchange of ideas, co-operation, innovation

Source: Edvarsson (2008)

3.6.10 Time and Relevance

Research conducted by Hew and Hara (2007) suggested that lack of time and lack of familiarity were two importance reasons for failing to share knowledge in online communities. Bartol and Srivastava (2002) linked the issues of lack time and resources with the question of reward for the outlay of these resources. They therefore suggested that potential knowledge sharers will calculate the value of possible benefits or rewards before deciding whether to share.

Summary

This chapter started with some definitions of knowledge sharing that emphasised themes such as the nature of knowledge shared and the value accrued by knowledge once shared. Subsequently, theory on interrelated organisational factors such as Culture, Leadership and Structure were considered along with theory on individual factors such as the Theory of Reasoned Action, Social Capital Theory and Communities of Practice.

Key knowledge sharing factors emerging from the literature were then examined. Some such as culture and trust and rewards were grounded in literature from the theoretical context section. Others such as physical structure, time and relevance had received comparatively little research attention but appeared in reviews of knowledge sharing factors (Riege, 2005; Wang and Noe, 2010) and thus deemed worthy of inclusion.

In chapter 4, the context of higher education is chronicled and discussed and this is followed by an examination of how knowledge sharing factors affect public organisations in general and the university context in particular.

Chapter 4

Knowledge Sharing in Universities

Knowledge sharing between academics is the theme of this thesis, thus the higher education landscape is considered first in this chapter as a context for the knowledge sharing. Universities also form part of the public sector in the UK and therefore knowledge sharing in that sector is then examined. This is followed by an analysis of knowledge sharing factors that have been identified in the literature as particular to sharing between academics in higher education.

4.1 The Context of Higher Education

The UK system of higher education in the 1960's was still a largely unregulated one catering for a small percentage of students that rose from 8.95% in 1965 to 13.8% in 1972 (Deem, 2004). Academic work was regulated only my academics within the university and fees were collected on means tested basis from student's parents, although the first breach in the autonomy of Universities was in 1964 when the University Grants Commission became responsible to the Department of Education and Science (Boyett, 1996). This era of academic autonomy was somewhat curtailed by the election of the conservative government in 1979 with an agenda to bring market forces to bear on the administration of publicly funded institutions such as universities. The means testing system was removed by the Labour government in 1998 who introduced a system of standard tuition fees. A

period of expansion followed this change and in 2002, 35% of 18-20 year olds and 43% of 18-30 year olds attended a higher education institution (Deem, 2004). This growth was however achieved against a backdrop of reduced income for Universities and a decline in earnings relative to other professions for lecturers and researchers. There was a 36% decline in funding for each student during the period 1989-1997, but this cut was unevenly applied with Arts, Humanities and Social Sciences being the losers and Science and Technology the beneficiaries (Deem, 2004).

Taylor (2006) believed Higher Education can be divided into two segments with vastly different traditions and characteristics. The first of these is the pre-1992 universities established by royal charter giving '... high levels of autonomy and traditionally run by and for the academic community' (Taylor, 2006:252). This type of university was also characterised by drawn out decision making and management dominated by academics with administrative staff occupying only a support role. Academic saw the function of overseeing teaching and research as central to their role instead of the management of administration and financial aspects (Deem, 2004). Ideas of new public management such as obtaining skilled managers began to permeate these universities during the 1980's when the Vice-Chancellor effectively became Chief Executive of the institution (Taylor, 2006).

The second segment contained the former Polytechnics that were given University status after 1992. This was a change that almost doubled the number of UK universities (Boyett, 1996). They were more bureaucratic in character with a centralised and hierarchical management structure where all staff reported to line managers. Academic staff had less autonomy and their role was more reactive than proactive. Structures were more multidisciplinary in character and interdisciplinary combinations of staff in research and teaching became more common (Taylor, 2006).

The existence of these two types of institutions is a consequence of the development of the higher education sector and the influence of a more proactive approach to the sector by government. Parry (2001) suggested that there were three crucial historical periods in the development of universities should be examined separately. The first of these in the 1980's covers the first cost-cutting initiative of the new conservative government where a cut of 15% in public spending on universities was instigated and new courses had restrictions placed upon them. The Jarrett Report of 1985 led to devolved budgets and in a further assault on academic autonomy involved lay governors and administrators in the decision making process. The role of Vice Chancellors changed to that of Chief Executive instead of academic leader. Significantly, during this period the first Research Assessment Exercise (RAE) was carried out thus establishing the principle of competition for funds between universities based on quality of their research.

The period from 1987 to 1993 was marked by more cuts in university funding and by the end of that period local authorities no longer controlled Polytechnics. The University Funding council replaced the University grants committee and at the same time the tenure system for academics was scrapped. In 1992, Polytechnics achieved University status and academic standards were regulated by Higher Education Quality Council replaced in 1997 by the Quality Assurance Agency for Higher Education.

From 1994 onwards more students that the government expected were enrolling thus putting a strain on treasury finances. Consequently, student numbers were nationally planned and strict targets instituted_causing the expansion in Universities in terms of size and number that had continued largely unabated since the 1960's to stall. At the same time RAE quality standards became more stringent, thus increasing the competition for funds amongst universities.

Despite these measures, there were still significant issues to solve in higher education. Student numbers increased by 100% between 1990 and 1996, yet real funding per student declined by almost 30%. In addition, most commentators believed that the systems of grants were not fit for the purpose (Barr and Crawford, 1998). The Dearing Report of 1997 was set up to address these and many other issues in Higher Education.

Key recommendations of that report involved widening participation and removing the cap on student numbers imposed by the conservative government in order to respond to the anticipated increased demand. The report also suggested that universities should focus more on ensuring the employability of graduates as well as a review in funding arrangements which were causing students to largely pay their own tuition fees (NCIHE, 2007). Barratt (1998:148) summed up the change of emphasis signalled by the report as an '….elitist system which was intended to prepare a small proportion of 18-year-olds in the population for leadership roles is now seeking to provide lifelong learning to the majority of the population'. In addition, a new costing system introduced by the government in 1999 intended to show in detail the destination of Teaching and Research costs demonstrated a chronic shortage of investment in University infrastructure. This had been neglected while the construction of bids for teaching and research took first priority. The government responded to this my making some more money available for capital projects.

Taylor (2006) also drew attention to the debate on the value of traditional departmental structures that have been described as outmoded or something that worked well and should be valued. According to Dill and Spurn (1995) the decline in importance of the departmental structure had been driven by a climate of an increasing technological change and competition in the higher education sector. Taylor (2006) also cited the swift increase in student numbers and the availability of suitable technological systems as a key driver towards a more co-ordinated and

centralised approach to the recruitment and management of students. Subjects that bisected existing academic departments were also becoming more common thus were increasing the need for co-operation and co-ordination of activities. In addition the need to compete for students and funds for research with other institutions was driving the movement for restructuring universities in a way that would make them more responsive to the market.

The driver for organisational, cultural and structural change at universities during this time was identified by Deem (2004) as new mangerialism. This concept espoused the view that management practices in the operation in the private sector could benefit the public sector, devolving levels of financial responsibility to further down the organisational hierarchy and central control systems for monitoring performance (Deem, 2004). In addition, it mirrored the view of central government that private sector management ideas and process could encourage change. This was to include monitoring systems such as performance management (Milliken and Colohan, 2004). However, Deem (2004) suggested that the processes of new mangerialism may not transfer smoothly to the concepts of loyalty to subject and discipline and the difficulty of managing academics who are themselves trained to think critically. The results of these changes for academics themselves have been described as a reduction in autonomy, academic deskilling and a lack of consultation with academics about the introduction of information technology into the learning process (Slaughter and Leslie, 1997).There is however some evidence of a rethink by the government in response to complaints about bureaucracy. Consequently the White Paper of 2004 suggested that the 'sector itself has, with our endorsement, replaced a burdensome teaching quality assessment regime with a much lighter-touch process based on internal audit' (Department of Education and Skills (2004:76).

In 2003 the Government White Paper on The Future of Higher Education highlighted many changes to the university landscape. Firstly, new research

money was to be concentrated on larger units, but more importantly for knowledge sharing strengthening links between universities and business through regional development agencies and establishing twenty knowledge exchanges in order to promote business innovation (Department for Education and Skills, 2004). Furthermore an Arts and Humanities Research Council was established in order to cut down the interdisciplinary bureaucracy and boundaries.

In 2003, 60% of funding for an average university came from the state via the Higher Education Funding Council. Since then, there have been significant changes in the way universities are financed in England in particular (Shattock, 2013). The £3000 top up fee has recently been replaced by loan system which has allowed students to afford the fees paid under the variable fee arrangement (up to £9000). Shattock (2013) believed that universities have been slow to come to terms with the market system and have adopted a defensive posture as well as being more centralised and top down in their approach to decision making. Many universities also underwent some type of reorganisation during this period. Hogan discovered that 65% of 72 universities studied were substantially restructured between 2002 and 2007. The motive appeared to be expansion and rationalisation into larger units.

During the same period the market approach has also pervaded the nature of the academic offering which is now being depicted by the government as a marketable commodity rather than a public good (Courtney, 2012). The casualisation of academic work has also been a prominent trend in recent years. For example, in the UK, between 40% and 50% of academics are now working on a flexible basis and many authors have commented on the marginalisation and resulting isolation of hourly paid lecturers in particular (Courtney, 2012). Conversely, flexible working has also meant that academics and administrators are often working more closely together

offering more opportunities for professional groupings to learn from each other (Shattock, 2013).

4.2 Knowledge Sharing in Higher Education

The success of knowledge management in other organisations is according to Cronin (2000) no guarantee of its success in academia despite the knowledge intensive character of higher education institutions. This is due to the fact that they are neither business, voluntary organisation nor professional practice although rudiments of all three do exist in higher education institutions. Additionally, there is a social purpose element as in organisations such as the hospital. Cronin (2000) contrasted the existence of strong recognised corporate cultures such as 'the HP way' with the absence of any such universal culture at any higher education institution. Despite a lack of research into factors affecting knowledge sharing in higher education some factors such as Culture, Structure, Leadership, Technology and Human Resource Processes have been examined and these will be discussed in the forthcoming sections.

4.3 Barriers to sharing knowledge in academia

The unwillingness to share knowledge due to loss of status or power in organisations in general has been explored in Chapter 2 but in the opinion of Tippins (2003) this can be a more significant factor in academia because of the emphasis on publishing primary research which is highly individualist undertaking. Although Rowley (2000) points out that producing and distributing knowledge does lead to recognition.

Some further barriers to knowledge sharing suggested by Tippins (2003) are:

- A lack of interest amongst faculty members who have become disengaged and sometimes use the tenure system as an enabler for this behaviour

- Conflict amongst faculty members
- Expertise possessed by some faculty members is not comprehensible by others
- Lack of face to face contact and working from home inhibits the building of social knowledge sharing relationships and limits the opportunities for tacit knowledge exchange
- Academics may be unaware of appropriate sources of knowledge
- Balancing workload commitments: although the workload of academics has increased in recent years the same point could equally apply to other organisations, thus time has become more of an issue.

Cronin (2000) also suggested that the introduction of any new or different way of working is problematical given the dislike for planning initiatives from the top. Naturally this would be further compounded by the existence departmental sub cultures and the tradition of academic freedom already discussed.

In addition, the phenomenon of star professors (Cronin, 2000; Rowley, 2000) has meant that their loyalty lies very much with their own career aspirations rather than the employing institution, though the focus on rankings such as the RAE has given more team focus than in the past (Cronin, 2000). Indeed Rowley (2000) suggests that working in teams can be more prevalent in some departments, for example for pooling talents for a scientific project.

Calabrese and Shoho (2000) believed that University personnel may be suffering level one anxiety in the face of change, which according to Schein (1994) suggests a sense that the changing situation is unstable and out of control, and definitely less palatable than the old ways. A main contributory factor to this situation in Universities is that they may not have kept in touch with their environment or the demands for change it produces.

Culture has been explored thus far in terms of academic members of staff but it is important to also consider the impact of administrative sections of each department. Cronin (2000) pointed out that the terms 'administrator' and 'manager' have different connotations in academia, the former conjuring images of service and the latter associated with the new managerialism movement in the UK with the accompanying focus on direction towards quality measures and targets. This could certainly impact on the barriers cited by Tippins (2003) such as increasing workload and disengagement of staff used to the more collegial way of working.

4.4 Factors influencing knowledge sharing in Higher Education

4.4.1 Organisational Culture

In the previous chapter the concept of organisational culture was perceived to consist of values, belief and norms that can be read by using such models as the cultural web. It was also established that culture can both enable and act as a barrier to knowledge sharing. The influence of subcultures will be discussed in more detail in the next section but initially models of culture proposed by Dopson and McNay (1996) in higher education will be examined.

Collegial Culture

This typified by Oxbridge and places the emphasis on individual autonomy and the pre-eminence of Dons in decision-making.

Bureaucratic Culture

Exhibits typical bureaucratic characteristics such as management through hierarchies and meetings. Dangers of this approach were considered to be an over reliance on a standardised approach and slow reactions to environmental changes. It is considered to lend itself well to the operation of quality control systems

Entrepreneurial Culture

This is linked to Handy's task culture and relates strongly to the interests of stakeholders throughout the sector. One danger of this approach is an overreaction to the influence of market forces. This type of institution has typically pursued Investors in People Status.

Corporate Culture

Handy's power culture is said to be in the ascendancy in this type of culture. Power is highly centralised with the directorate who appoint persons to key positions. It is claimed that this culture is characteristic of many modern universities. According to Dopson and McNay (1996) it is also highly manipulative.

There is little research on the effects of these cultures on knowledge sharing. Although, clearly, as discussed earlier in the chapter a bureaucratic structure does not facilitate knowledge sharing due to the top down nature of the structure. However autonomy as exhibited in the collegial culture is a characteristic of empowerment and this can lead to higher levels of knowledge sharing, although this may be tempered by the individualist aspect of that culture.

Subcultures

There may be a single overarching culture on the lines of Dopson and McNay's model (1996), but Lee (2007) suggested that academics can also viewed through different cultural lenses, as individuals with loyalty to their discipline, as departmental members and also as part of other subcultures.

Lee (2007) emphasised the importance of the academic department is due to its position as a meeting point for the influences of the University and discipline, and Cronin (2000) went further in suggesting that the prime

loyalty of many academic staff is to the discipline. This can affect the relative degree to which academics identify with their institution or their discipline. Gouldner and Merton (1957 as cited in Lee 2007) named academics that show a greater affinity for the local institution 'locals' and those who show a greater affinity for the discipline 'cosmopolitans'.

Lee (2007) suggested a methodology for comparing the effects of institutional and disciplinary culture on aspects of departmental culture. The findings implied that institutional culture generally had more influence on factors such as departmental; perceptions of students, research and professional workload, but with regard to multiculturalism and instrumentalism the effect of disciplinary culture was more significant.

4.4.2 Organisational Structure

Clearly the movement towards new managerialism and a host of other factors such as the government, market forces, administrative history and even the building design has affected the culture and structure of Universities and their departments. Hogan (2012) pointed out that rationalisations had resulted in larger faculties but academic departments and schools continued to exist as part of those faculties. However, they were now further away from a more centralised decision making process.

Tippins (2003) noted that academics have been much quicker to espouse the notion of knowledge management from a teaching point of view rather than something that can be implemented to enhance the sharing of knowledge between academics themselves. He further suggests that one of the main reasons for this is the functional structure of most universities, and that this structure inhibits knowledge sharing within individual business departments. Hislop (2009) sees the decentralised network based structures as the most advantageous for knowledge sharing. Nevertheless the functional model persists to large extent. However, the situation at larger institutions and

multi campus universities such as Manchester Metropolitan University is slightly more complicated with a divisional structure (in terms of faculties) grouping academic departments together in a smaller number of large faculties. Hogan (2012) argued that this policy has diminished the feeling of collegiality and lessened the closeness of disciplinary relationships.

However functional boundaries are still very much in evidence in most universities. Indeed it could be argued that the divisional structure increases the hierarchy thus providing another disincentive for the sharing of knowledge. A centralised divisional structure, functional specialisation, the application of a set of formal rules, for such purposes as assessment and attendance, all point to a bureaucratic and mechanistic structure. However this point is perhaps more applicable to administrative functions within universities. Grant (1996) recommends delayering whenever possible on the basis that hierarchical structures inhibit the sharing of tacit knowledge by discouraging face to face contact.

From a strategic standpoint Boddy (2005) pointed out that functional structures are more associated with cost leader strategies, whereas organic structures such as matrix and network structures are associated with differentiation, flexibility and innovation and creativity which are surely more in keeping with the role of a modern university. Crucially, matrix and network structure also facilitate knowledge sharing and management according to Tucker (1999).

A further complicating factor is that according to Lee (2007) academic departments 'idiosyncratic and complex' as well as possessing their own standards, norms and policies and criteria for advancement. Lee suggests that this is a result of the tension between the demands of the overall institution and the academic discipline itself. This idea could be considered an extension of the divided loyalties of the lecturer between academic subject and institution.

Lomas (2006), however suggested that the nature of structure is strongly determines by its history and type. For example, Oxford and Cambridge are cited as being less centralised and with more power being held in the departments, and this in turn intensifies competition for resources between those departments, and, in contrast Polytechnics that received their university status in 1992 already used to more centralised control and a culture of quality. Shattock (2012) also pointed out that the 'manager-academics' often appointed from outside the university to replace Deans were loyal to the centre rather than to any academic area. Hence they are likely to be envoys of downwards communications from the centre (rather than in the opposite direction) when sensitive issues such as reorganisation are being discussed. Alongside this, hierarchies have been created to support the growing power of the centre to replace decision making processes that were previously horizontal.

However in academic departments themselves it could be argued that the matrix system is predominant in most universities. There is Head of Department and usually a Senior Management team who communicate vertically, whereas subject groupings and communities of practice communicate laterally. Head of Departments have a broad span of control, and consequently keeping staff motivated on a personal basis is difficult (Rowley, 1996).

4.4.4 Leadership

The importance of leadership style in enabling the sharing of knowledge through empowerment of staff and transformational leadership (rather than transactional or laissez faire) has already been established. The Department of Skills White Paper (2004) referred to the multifaceted nature of leadership within Universities by for example suggesting that a competency as a strategic business leader is now becoming much more of a necessity for Vice

Chancellors. Naturally, the more complex nature of leadership in higher education will also affect faculty and departmental leaders.

Earlier discussion focussed on the managerialist tendency in higher education in recent years and it is also important at this stage to distinguish leadership from management, particularly as Davies et al. (2001) suggested that faculties departments have historically been managed rather than led. Huczynski and Buchanan (2007) suggested the following distinctions between management and leadership functions.

Table 4.1: Management and Leadership functions

	Leadership Functions	***Management Functions***
Creating an agenda	*Establishing direction* Vision of the future, develop strategies for change to achieve goals	*Planning and budgeting* Decide actions and timetables, allocate resources
Developing people	*Aligning people* Communicating vision and strategy, influence creation of teams which accept validity of goals	*Organising and staffing* Decide structure and allocate staff, develop policies, procedures and monitoring
Execution	*Motivating and inspiring* Energise people to overcome obstacles and satisfy human needs	*Controlling and problem solving* Monitor results against plan and take corrective action
Outcomes	*Produces positive and sometimes dramatic change*	*Produces order, consistency and predictability*

Source: Huczynski and Buchanan (2013:254)

Leaders therefore undoubtedly establish direction, motivate and communicate vision. However Davies et al. (2001) has suggested

departments and faculties are generally lacking in those important qualities. Instead functions such as planning monitoring and controlling which can support so well the new managerialist philosophy will predominate.

Yielder and Codling (2004) suggested that there are two types of leadership in play within higher education. Academic leadership attributes accentuate knowledge, professional recognition and expertise, personal qualities and team acceptance, thus the power base is a personal one. In contrast, Managerial leadership accentuates hierarchical position, job responsibilities, control and authority and power is vested in the position rather than the person. Academic leadership is broadly assigned to the traditional more collegial university whereas Managerial leadership is associated with the corporate style model. However significant tensions can exist when those promoted for managerial ability are called upon to judge academic situations (Yielder and Codling, 2004). They highlighted the contrasts in the following table.

Table: 4.2 Managerial and Academic leadership

Mode 1 Leadership: Academic	***Mode 1 Leadership: Managerial***
Leader is **an** authority based on • Discipline knowledge • Experience • Peer and professional recognition • Personal qualities • Expertise- teaching, research, programme development • Team acceptance Leadership context: Collegial Formalisation; bestowed from below. Leadership is vested in the ***person*** because of their personal characteristics, and perceived expertise	Leader is in authority based on • Position in hierarchy • Job responsibilities (e.g. Financial management, human resource management, planning) • Control (e.g. Budgets, resources, accommodation) • Delegated authority • Power Leadership context; corporate formalisation: appointed from above. Leadership is vested in the ***position*** and the person may or may not have the capabilities to exercise this leadership

Source: Yielder and Codling (2004:322)

Jackson (1999) felt that as there has been an increasing amount of scrutiny of departments (in line with the movement towards new managerialism), and that this has been reflected by a more interventionist tendency amongst heads of department. However, they have been hampered in this approach according to Middlehurst (1993 as cited in Jackson, 1999) by a lack of power in terms of controlling promotion and other rewards. In older Universities the concept of discretionary pay and lump sums existed far more than in the new universities but the Head of Department's opinion on remuneration would be one amongst others sought.

Lack of training for departmental leaders is another of Jackson's (1999) themes and Spendlove (2007) also made reference to the need to develop leadership competences in academia much earlier. Spendlove (2007) suggested a number of leadership competencies for academia suggested by Pro Vice Chancellors

Table 4.3: Competencies for effective leadership in higher education

Attitudes-What good leaders are	**Knowledge- what good leaders know**	**Behaviour- what good leaders do**
Self-aware, Flexible	Knowledge of university life	Work to maintain academic credibility/respect
Open, Honest	Understand how the university system works	Act as role models
Discrete, Visible, outgoing	Understand academic processes	Think broadly/strategically
Willing to be wrong/accept wrong advice support		Engage with people
Sensitive to the views of others		Listen to others
		Motivate, Build teams
		Negotiate, Delegate
		Communicate clearly

Source: Spendlove (2007:415)

It can be seen from characteristics such as delegation, consultation, building and teams that in terms of Vroom and Yetton's (1973) model discussed in Chapter 2, that the preferred style is towards consulting and negotiating which in turn suits the more participative style suggested by Politis (2001) as useful for stimulating knowledge flows

Some charismatic qualities as suggested by Rowden (2000) are absent such as vision, unconventional behaviour, taking personal risks and not maintaining the status quo. Although environmental sensitivity and sensitivity to members needs are clearly alluded to, the lack of charismatic and indeed transformational qualities could hamper knowledge transference, although there is no evidence that a transactional style hinders knowledge sharing (Politis, 2001).

Lumby (2012) suggested that it is the academic environment itself that shapes the nature of its leadership. She asserted that the environment is distinctive because of diversity of cultures and in particular the fact that '...academics demand autonomy and protection' (Lumby, 2012:5). Consequently the resistance to and restrictions on leaders make it different a different role than it is in other sectors. There was also a feeling among academics that leadership itself lacked importance and there was little agreement about what constitutes an effective leader (Lumby, 2012). Indeed earlier research by Middlehurst (1993) had discovered that heads of department already perceived their own lack of power and authority in attempting to manage academics that did not feel part of a structure and instead they attempted to lead by inspiration or by trying to gain consent.

A study of 23 differing universities and some additional higher education providers highlighted some important perceptions of academic leadership that again set it apart from other organisations (Bolden et al. 2012). First of all, academic leadership is not always confined to those in management roles. Examples of perceived significant leaders were PhD supervisors,

previous colleagues, and important scholars. Academics also wanted a high level of autonomy in their work and to that extent were perceived as being self-led. Consequently, it was though this could limit the effect of formal management processes, although managers could certainly affect the context of the working environment (Bolden et al. 2012).

A further conclusion is that academics perceive leadership in behaviour that:

- Delivers and maintains an environment that supports fruitful work
- Helps shared values and identity to develop
- Achieves boundary spanning

Academics also recognise leadership in academics who share contacts, career opportunities and other resources.

(Bolden et al. 2012).

4.4.5 Collaborative Technology

If the knowledge infrastructure (Create, Collect/Codify, Store, in a knowledge repository, and Diffuse/Use) discussed in Chapter 2 is used as a model it can certainly be argued that knowledge is created by research then collected, codified and shared and used by other researchers.

In addition, Rowley (2000) points out that universities are in possession of multiple knowledge repositories, such as student databases, lecturers own material and databases accessible through the library, but feels that these must be co-ordinate and structured so that knowledge can be managed in a more proactive way. Consequently it can be questioned whether such knowledge is sometimes shared beyond the department it is created in. Rowley (2000) suggested that the time when university staff can find a collective combination of knowledge and wisdom from will not arrive for some time. Similarly, Steyn (2004) points out that in Universities '...The

focus should be on managing the university to include a knowledge perspective instead of on knowledge as such.'

The access to knowledge is necessary for diffusion to take place and network infrastructures in terms of groupware and electronic databases is highly comprehensive and leads to co-operation amongst institutions in higher education according to Rowley (2000), but significantly this relates mainly to the management of explicit rather than tacit knowledge. The importance of attitudes towards technology was highlighted in a study of information sharing by academics and administrative staff. This demonstrated that a lack of positive perceptions of information linked to computers led a disinclination to use collaborative systems (Jarvenpaaa and Staples, 2005).

Finally, in more strategic sense, universities generally saw the creation of collaborative electronic networks and virtual communities as vehicles for making universities more democratic (Lewis et al. 2005). However, Noble (1998) believed greater use of network technology in higher education would facilitate deskilling and a reduction in autonomy for academics and result in education simply becoming a commodity.

4.4.6 The Role of HRM

According to Jackson (1999), selection methods in higher education can vary a great deal and this is to a large extent a consequence of the administrative history of the more traditional and newer universities. Jackson (1999) also questioned the requirements for the job of head of department in different situations and comes to the conclusion that in older Universities appointments were not made primarily on an ability to manage and having more of an academic dimension. Newer universities made appointments following press adverts and are considered to be more managerial in approach although not comparable to a line manager in private industry. Jackson's (1999) research did however establish that in the new universities both academic and managerial attributes were sought after for the role.

Indeed, recruitment of staff could be a long process which sometimes took up to a year. PhD students from the UK were often not considered and a trend towards recruiting star researchers became noticeable. Research was found to be the pre-eminent criteria for promotion therefore placing candidates with substantial teaching and administrative roles at a disadvantage. However staff were often unsure of the requirements for promotion. A distinction often exists in employment conditions of researchers and lecturers. Research staff tended to be employed on a fixed term contract basis whereas lecturing staff are usually employed on a permanent basis (Metcalf et al. 2005).

There is very little research concerning performance management of academics. However, Jackson (1999) suggested that departmental heads lacked real powers to address poor performance although particular action can be taken against those staff not considered to be research active but having the potential do so. Departmental heads can exercise the most power over new staff during the three year probationary period, although in general their powers were not as great as a comparable post in private industry due to the professional freedom and autonomy still enjoyed by academics to some degree even in new universities (Jackson, 1999).

Reward systems in academia have strongly benefitted those who publish regularly (Turner and Gosling, 2012). According to Rowley (1996) academics are positioned on a single salary scale that is influenced by experience and qualifications. Increases in salary are then on an incremental basis although sometimes increments are used for a particular attainment. External opportunities for extra earnings do exist but promotion is uncommon. Motivation could be an issue if lecturers move to academia from a sector that utilises performance related pay (Rowley, 1996).

The system of rewards for publishing has remained largely unchanged; however the Dearing Report suggested that teaching excellence should be incentivised through more formalised reward systems (NCIHE, 2007). This has subsequently been achieved in most UK universities and the establishment of 74 Centres of Excellence in Teaching and Learning (CETL) has been an important part of this process (Turner and Gosling, 2012). Parker (2008) however considered that progress towards greater recognition in teaching excellence has been limited and pointed out that upper grades in academia are still mainly the preserve of researchers.

A variety of incentives are offered to academics in connection with recruitment and retention according to Metcalf et al. (2005). These consist of increments that can be awarded when a member of staff was offered another job, fast track promotions and reduced teaching and administrative loads to facilitate research. However, Scarbrough (2003) suggests that explicit rewards for knowledge sharing can be divisive and should be more innovative in character. Significantly, appraisal systems, a possible vehicle for promoting knowledge sharing were not were not found to be associated with the either promotions or training and development opportunities.

4.5 Research into knowledge sharing in the Public Sector

Universities are a substantial part of the public sector and consequently an examination of knowledge sharing in that sector is justified. Although it is certainly acknowledged that universities have unique characteristics within that sector and knowledge sharing in the higher education context will be discussed in the next section.

Liebowicz and Chen (2003) asserted that in the public sector knowledge is linked with power and employees may feel that sharing may threaten promotion chances. However, Cong and Pandya (2003) suggested that historically there has in any case been little understanding of knowledge management and knowledge sharing in the in the public sector compared to

the private sector, partly because knowledge management is driven by the need for product competitiveness in the private sector. Willem and Buelens (2007) argued that the movement towards New Public Management started in the Thatcher years has helped to facilitate a move to greater knowledge sharing by championing a move away from the bureaucratic structures and silo mentality that tend to limit knowledge sharing. This has been achieved by promoting decentralisation and teamwork.

The importance of trust in knowledge sharing in the public sector was also stressed by Hock et al. (2009) who suggested that this factor had figured prominently in many studies of sharing in the public sector. Willem and Buelens (2007) also found trust to be critical in their study of sharing knowledge between public sector departments and highlighted existing public sector values like honesty, fairness and equity. Although Cong and Pandya (2003) believed that one effect of New Public Management was to engender distrust of management and that this could negatively affect the trust factor. On a similar theme, Willem and Buelens (2007) believed that power games and abuse of networks were more prevalent in public organisations partly because of the lack of lateral co-ordination and that these could again act to reduce levels of trust.

Research by Syed-Ikhsan and Rowland (2004) suggested that the most significant factors determining transfer of knowledge in addition to trust were organisational culture, organisational structure, technology and human resource systems. However, political directives were also referred to as highly significant because of their effect on the behaviour of employees. Currie and Suhomlinova (2006) studied knowledge sharing in the National Health Service and highlighted the inhibiting effect of cultural, regulatory and professional boundaries to knowledge sharing and concluded that development of a learning in such a context would be problematical.

Gorry (2008) suggested that utilisation of ICT systems by employees to share knowledge was also essential and that this could be achieved by using reward systems and appointing knowledge champions.

Thus most factors generally relevant to knowledge sharing which were discussed earlier in the chapter have been mentioned as significant in the public sector. Trust and culture are again crucial but more emphasis is placed on organisational structure and the effect of bureaucratic characteristics on sharing. Political directives and the effect of new public management are context specific additions to factors discussed earlier and these could also be important in Universities where government policies and the application of new public management have changed the landscape of higher education in recent years.

4.6 Research into Knowledge Sharing in Universities

Howell and Annansingh (2013) performed a study of knowledge sharing in a post-92 university and a Russell Group institution. Findings indicated that academics at the post 92 university were aware of the advantages of sharing knowledge but believed that knowledge silos were a characteristic of their environment and the lack of systems and a champion to encourage sharing resulted in very little motivation to share. This was also evident in a culture of guarding teaching material, although there was some limited willingness to share research output. In contrast academics at the Russell group institution were prepared to take lead role in the knowledge sharing process and mechanisms for sharing such as research groups and team meetings were already embedded. Howell and Annansingh (2013) believed that this situation was in part a consequence of the path dependency of each institution and also a consequence of the Research Excellence Framework. This created a situation that post-92 institution staff considered to be a completion and this acted as a disincentive to share knowledge. The post-92 university was still following a course that dated from its polytechnic days

whereas the Russell Group University was following its own established route that emphasised a culture of research that was highly collaborative in nature.

Research performed by Sohail and Daud (2009) examined the effect on knowledge sharing of the following five variables: nature of knowledge, working culture, staff attitude, opportunities to share and motivation to share. The conclusions were that all factors play a significant role but that private universities required a systemic change from mechanistic to organic in order to promote knowledge sharing and university administrators should set up more forums and seminars to facilitate knowledge sharing.

A further survey of knowledge sharing between academics in a private Malaysian university was carried out by Cheng, Ho and Lau (2009). The situation at this university is somewhat different from the norm because it is mandatory for academics to make regular contributions to an online database. The investigation concludes that incentive systems and personal expectation, particularly with regard to reputation building, are positively associated with knowledge sharing and both monetary and non-monetary rewards encourage sharing of knowledge. The technology system was not found to be a disincentive to sharing.

Zawawi et al. (2011) surveyed 17 public universities again in Malaysia and concluded that the most important barrier in knowledge sharing was the lack of organisational rewards. The second most important barrier was lack of ICT systems and a small negative correlation was found also between self-efficacy and sharing knowledge.

In their 2005 study of North-Eastern University in China, Fan and Bo found that organisational culture and individual competences were the most important factors in the promotion of knowledge sharing.

A case study conducted in of the University of Johannesburg Faculty of Management by Buckley and Giannakopolous (2011) discovered a general belief that shared tacit knowledge leads to more personal effectiveness There was a strong focus on communities of practice in the research but only just over half of respondents knew the meaning of the term 'community of practice' and just above 18% of those surveys were members of one. There is also very little research concerning trust specific to the higher education context, however van Westrienen and Lynch (2005) pointed out that some academics were unsure about placing their work into knowledge repositories because of intellectual property concerns.

4.7 Research Gap

Research into knowledge sharing in the higher education sector is therefore extremely limited despite the plethora of research carried out in the commercial sector and other public sectors. However, some research has been performed in Malaysian and Korean universities in recent years as discussed in the previous section. These featured characteristics of sharing in the public sector discussed above such as organisational culture and reward. However, consideration should be given to the fact that the latter research was carried out in collective high context cultures.

The academic context is differentiated from many other organisations by characteristics discussed earlier in the chapter such as a high level of autonomy and individualism as well as significant sub cultures. Nevertheless, successful knowledge sharing is no less important in the university context, particularly considering their role is as knowledge creators and disseminators Howell and Annansingh (2006). Consequently this research seeks to address that gap by contributing to literature on knowledge sharing in between academics in university departments and suggest ways to improve those processes. A further aim is to develop a model of factors that affect academic staff in relation to knowledge sharing.

Summary

Consideration of the higher education context in this chapter revealed the high level of autonomy that still exists largely undiminished within the higher education sector despite the impact of new mangerialism and the marketization of the university sector engineered by the current government. Factors discussed in relation to sharing knowledge in higher education to some extent mirrored those in the previous chapter; however the impact of subcultures and affinity to disciplines emerged as particular characteristics of the sector along with the consequent challenges for academic leaders. Research on knowledge sharing in the public sector was subsequently examined along with research on knowledge sharing in the higher education sector itself, although much of this was not performed in the UK. The next chapter looks at the development of a broad philosophical approach to methodology and factors influencing choice of research methods and research design.

Chapter 5

Research Methodology

This chapter begins by identifying broad philosophical approaches to research and then focussing on the rationale behind mixed methods approaches. Research approaches in knowledge sharing are then considered and subsequently the approach for this thesis is chosen. The research design section then looks at relationships within the research model and hypothesised relationships are generated. Concerns regarding questionnaire and interview design are then discussed before a consideration of ethical issues, reliability and validity concludes the chapter.

5.1 Philosophies and Paradigms

5.1.1 Choice of Research Paradigm

Foucault (1972) believed that a paradigm is a way of thinking that emerges through discourses and actions to become the dominant mind-set of the day. Similarly, different research paradigms have come to the fore through history as the character of beliefs, ideas and discourse changes and these will be examined later in the chapter.

Clearly researchers have their own beliefs which can be affected by their own experience and mind-set. Guba and Lincoln (1994) believed that

paradigms in research are determined by how the researcher answers to three crucial questions concerning ontology epistemology and methodology:

The epistemological question: What is the nature of the relationship between the knower or would-be knower and what can be known?' In this approach the relationship between the researcher and the researched is examined.

The ontological question. What is the form and nature of reality and, therefore, what is there that can be known about it? 'Ontological considerations focus on whether there is an objective reality or a socially constructed one (Bryman and Bell, 2011).

The methodological question. How can the inquirer (would-be knower) go about finding out whatever he or she believes can be known?' Naturally this final question is informed by the researcher's ontological position.

Epistemology, (the relationship between researcher and researched), concerns the nature of knowledge that can be accepted for a particular discipline (Bryman and Bell, 2011). Positivism is the epistemological position that is associated with natural science approach and pre-dated other paradigms. The table below shows four approaches. Positivism and Post-positivism are naturally associated with positivist philosophy thus accentuate the objective nature of research whilst Critical theory and Constructivism are both interpretivist philosophies and stress the inextricable link between researcher and researched.

Table 5.1: Basic beliefs (Metaphysics) of Alternative Inquiry Paradigms

	Positivism	***Post positivism***	***Critical Theory***	***Constructivism***
Ontology	naive realism- 'real' reality but apprehendable	critical realism- 'real' reality but only imperfectly and probabilistically apprehendable	historical realism virtual reality shaped by social, political, cultural, economic, ethnic, and gender values; crystallized over time	relativism-local and specific constructed realities
Epistemology	dualist/objectivist findings true	modified dualist/ objectivist; critical tradition/community; findings probably true	Transactional/ subjectivist; value mediated findings	Transactional/ subjectivist; created findings
Methodology	Experimental/ manipulative; verification of hypotheses; chiefly quantitative methods	modified experimental manipulative critical multiplism; falsification of hypotheses; may include qualitative methods	dialogic/dialectical	Hermeneutica/ dialectical

Source: Guba and Lincoln (1994:22)

5.1.2 Positivism

This approach is and is strongly associated with natural science and as such stresses objective measurement of phenomena, the collection of generalisable data and the construction of hypotheses (Bryman and Bell, 2011). It could be considered the most prominent research methodology until comparatively recently. It has existed at least since the time of Auguste Comte who was a prominent supporter of positivism. '….all good intellects have repeated since Bacon's time that there can be no real knowledge but that which is based on observed facts' (Easterby-Smith *et al.* 1991). Correspondingly in epistemological terms, positivism views the world as external and the observer as a detached entity. Easterby-Smith *et al.* (2002) identified the following implications for Positivist viewpoint.

Table 5.2: Implications for the Positivist Viewpoint

Independence	The observer should be independent.
Value freedom	Objective criteria take precedence over beliefs.
Causality	Fundamental laws and causal explanations are sought.
Hypothetico-deductive	Hypotheses are measured using quantitative data.
Operationalisation	This needs to be done in such a way as to utilise quantitative data.
Reductionism	Problems become clearer if they are reduced to the simplest elements
Generalisation	Sample size needs to be of sufficient size for generalisations
Cross-sectional analysis	Samples can be compared for consistency with each other.

Source: Easterby-Smith et al. (2002)

Positivism is purported to still be in the ascendancy in science (Healy and Perry, 2000), and Burns (2000) refers to some strengths of this approach as being precision, control and the production of research which 'has a much firmer basis than the lay person's common sense or intuition opinion', although certainly this allusion to a firmer basis is certainly subjective and dependent on the researcher's standpoint.

5.1.2 Constructivism

Constructivism arose as alternative to the idea that there is one single objective reality. 'Fifty years of experience have taught us that knowledge does not result from a mere recording of observations without a structuring activity on the part of the subject' (Piaget, 1980). Consequently, the central tenet of constructivism is that multiple mental constructions can exist which can be shared amongst others (Hansen, 2004). The researcher and his or her values are inextricably linked to the situation that is being researched (Guba and Lincoln, 1994). In Social constructivism (Easterby-Smith *et al.* 2002), 'decision makers, by collecting and analysing information create the

environment they respond to, we say they socially construct their environment' (Hatch, 1997). This therefore becomes a self-renewing adaptive process.

Constructivism and Critical theory are also two examples of the interpretive research which...'starts from the position that our knowledge of reality, including the domain of human action, is a social construction by human actors and that this applies equally to researchers' (Walsham, 1993). Consequently, the perspective of the researcher has changed from the positivist position of dealing facts and measuring objectively to being able to '….appreciate the different constructions and meanings that people place upon their experience' (Easterby-Smith *et al.* 2009:59).

5.1.3 Paradigms for the Analysis of Social Theory

A different model has been proposed by Burrell and Morgan (1979). They highlighted the nature of society and the nature of science as two critical dimensions that can be used to develop a philosophical position. The views of the nature of society are represented in regulatory and radical change, whilst the nature of science is represented by the subjectivist and objectivist approaches. The four paradigms depicted below are developed from overlaying these views of society and dimensions.

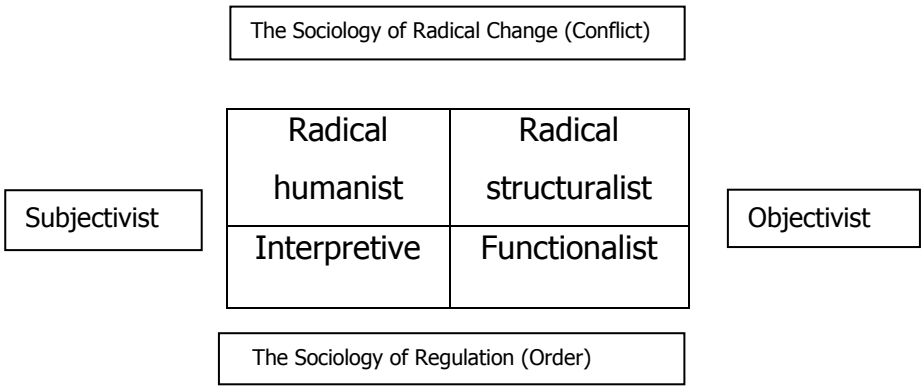

Figure 5.1: Four Paradigms for the analysis of social theory
Source: Burrell and Morgan (1982)

In the diagram above, the regulatory perspective depicts changes within the current organisational framework rather than anything transformational, and the radical dimension refers to changes which are fundamental (Saunders et al. 2009). The objectivist perspective is appropriate for this perspective. An understanding of the different perspectives can help researchers clarify their own objectives and approach based on what they are seeking to achieve from their research.

The functionalist paradigm indicates an objective approach that lead to the development of solutions based upon the current order within the organisation and could involve the study of the politics of the organisation (Saunders et al. 2009).

The interpretive paradigm suggests research is centred on the idea that members of organisations are social actors and there is a necessity to understand and interpret their experience (Bryman and Bell, 2007).

Burrell and Morgan's ideas have however been subject to a great deal of criticism since their inception. For example, Deetz (1996) blames them for the continuation of the '...perpetuation of the subjective-objective controversy', which has resulted in classifications of research programmes

based on flawed logic. However they have been profitably used to gain different insights into the same organisation (Bryman and Bell, 2011) thus utilising a combination of approaches that mirrors mixed methods research.

Goles and Hirschheim (1999) suggested that a major contribution of Burrell and Morgan's work was "…. to legitimise alternative approaches to the study of organisations by bringing to light a growing dissatisfaction with the functional orthodoxy". Similarly, Lewis and Kelemen (2002) highlighted a widespread discontent amongst academics with the single paradigm approach which led to the pluralism of the multi-paradigm inquiry.

Morgan (2007) acknowledged the broadening of the list of acceptable paradigms within academic discourses but lamented the fact that pragmatism did not appear on such a list while at the same time noting the inherent inflexibility of the list approach. Morgan (2007) proposed a pragmatic approach that challenges the metaphysical approach in the same way as that approach challenged the positivist position.

5.1.4 Pragmatism

Pragmatism is often not included by researchers in classifications of research philosophies. However it is seen by many as an underpinning for mixed methods research and they consider that pragmatism '... offers an epistemological justification' for mixed methods research as weel as repudiating dualist traditions such as subjectivism versus objectivism (Burke Johnson *et al.* 2007:125). They believe that according to pragmatic logic, quantitative and qualitative approaches should be combined in a way that offers the best chance of solving research problems. Cresswell (2013) pointed out that this moves the focus of the research process away from methods to the problem, thus contentious debate about which method is the best (Burke Johnson and Onwuegbuzie, 2004), is to some extent sidelined.

5.2 Deductive and Inductive Approaches

In order to understand the nature of the deductive approach it is important to appreciate the concept of the hypothesis. This is prediction of what you think will happen if for example the relationship between two variables is changed (Saunders, *et al.* 2009). The deductive approach is normally bracketed with positivism, which is not surprising when the deduction process consists of deducing and empirically testing a hypothesis (Bryman and Bell, 2011).

In other words a hypothesis can be proved or disproved by data, which is then collected, and causal relationships can then be established. In addition, the deductive approach requires the independence of the observer and the reduction of the data to simple elements and before a generalisation can be made (Saunders *et al.* 2009). It can therefore be seen that the deductive approach shares many characteristics of positivism.

Induction is in many ways the opposite approach. It developed much more recently than the deductive approach and is associated with research in social sciences. Patterns and trends should emerge from the data collection, which could enable the researcher to form a theory, thus '...theory is generated from data' (Maylor and Blackmon, 2005).

According to Saunders et al. (2009), the most important factors determining the research approach will probably be the character of the topic itself and the research emphasis. Deduction is more applicable when literature on the topic is readily available and the researcher is able to formulate a hypothesis from existing theory. This sometimes called the hypothetico-deductive view. In contrast, when there is very little literature, an inductive approach where the researcher can gradually begin to identify trends and themes, is more appropriate. In addition deductive research lends itself to a planned linear approach (Bryman and Bell, 2011).

5.3 Qualitative and Quantitative Research Methodologies

A research methodology is also needed to conduct the process of research. Quantitative methodology pre-dates qualitative and according to Cresswell (2009) is associated with the post-positivist paradigm. As such it involves the gathering of numerical data and entails a deductive relationship between theory and research (Bryman and Bell, 2011). In contrasts qualitative research is interpretive in character and tries to makes sense of phenomena within their natural setting utilising both deductive and inductive approaches. Qualitative researchers tend to gather a multiplicity of data from interviews, documents, notes and observations rather than numerical statistics drawn from questionnaires (Cresswell, 2013)

Bernard and Ryan (2010) compare the types of data and means of analysis of the two approaches in the table below:

Table 5.2: Comparing Qualitative Research to Quantitative Research

	Qualitative Data	***Quantitative Data***
Qualitative Analysis	Interpretative textual studies	Search for meaning expressed via numbers
Quantitative Analysis	Word analysis with numbers	Statistical analysis of numeric data

Source: Bernard and Ryan (2010:36)

Deshpande (1983 as cited in Ali and Birley, 1999:104) sums up the qualitative paradigm as 'grounded, discovery orientated, exploratory expansionist, descriptive, inductive' while quantitative is described as 'ungrounded, verification orientated, confirmatory, reductionist, inferential, hypothetico-deductive'

Morgan and Smircich (1980) also clearly highlight the limitations of the quantitative approach. '...social scientists are in effect attempting to freeze the social world into structured immobility and to reduce the role of human beings to elements subject to the influence of a more or less deterministic set of forces'.

When the above attributes are considered and matched against the requirements of Positivism and other research approaches there appears to be little doubt that the numbers approach suit the positivist need for the hard data needed to prove or disprove a hypothesis whereas words and opinions can be conceptualised as crucial to developing and understanding of a situation. Thus in summary, a positivist or natural science approach employs deductive reasoning to analyse quantitative data and a phenomenological approach employs inductive reasoning to analyse quantitative data.

Although, broadly associated with phenomenology, qualitative data is considered by Denzin and Lincoln (2003) to have links with foundationalism, positivism, postfoundationalism, postpositivism, and poststructuralism. Gummesson (2003:485) however sees the qualitative versus quantitative debate as a 'red herring', which side-tracks us from the central issue of choosing 'a research methodology and techniques that support access and validity' (Gummesson, 2003:486).

5.4 Possible Strategies for conducting research

5.4.1 Mixed Methods Research

According to (Burke Johnson and Onwuegbuzie, 2004), debates concerning research paradigms have suggested that quantitative and qualitative are mutually exclusive. However recently there has been growing acceptance of the validity of using both in the same project. Mixed methods research is underpinned by pragmatist theory, discussed in section which asserts that disputes the outcome and consequences of the research is much more important than dualist disputes concerning for example the nature of reality and free will (Burke Johnson and Onwuegbuzie, 2004).

Bryman and Bell (2011) noted that between 1994 and 2003 there was a threefold rise in articles based on mixed methods research and in 2009, 12-17% of business and management research articles in used this approach. Furthermore, Burke Johnson, Onwuegbuzie and Turner (2007) suggested that mixed methods researched is '...recognised as the third major research approach or research paradigm, along with qualitative research and quantitative research'.

The origins of mixed, methods research can be attributed to Campbell and Fiske (1959) Their ideas were developed by Webb, Campbell, Schwartz, and Sechrest (1966) and the critical concept of triangulation emerged research where qualitative research can be used to corroborate or support the

findings of quantitative research or vice versa thus leading to more robust findings (Kaplan and Duchon, 1988).

Denzin (1978) also pointed out the benefits of mixed methods research for the purpose of triangulating data. Four types of triangulation were suggested:

1. Data triangulation describes the use of various data sources to increase validity.

2. Investigator triangulation refers to the use of different researchers

3. Theory triangulation suggests the use of various theories within the research

4. Methodological triangulation involves the use of different research methods within the same investigation

A convincing rationale for the use of mixed methods is provided by Teddie and Tashakkori (2009:35) who point out that this approach can look at confirmatory and exploratory questions at the same time, provides '...better inferences and the opportunity for a better assortment of divergent views'. They believe that a particularly robust combination is the use of in-depth interviews in conjunction with questionnaires. Even if the two methods provide differing results this can be advantageous because the researcher's attention is drawn to complexity of the situation and re-appraisal may make ensuing conclusions more robust (Teddie and Tashakkori, 2009).

Two distinct mixed method strategies have been suggested by Cresswell (2009). Sequential mixed method occurs when one methodology is used to broaden or qualify the findings of another one. Indeed, Bryman and Bell (2011) suggest that qualitative research can assist quantitative research by

providing hypotheses and informing the design of questionnaires. Similarly, quantitative data can guide qualitative such as in a case where questionnaire results were used to generate a sample for interviews. Concurrent mixed methods as the same suggests occurs when qualitative and quantitative data are combined. Cresswell and Plano Clark (2007) suggested the following three categories of decisions to be made with regard to the use of mixed methods research.

- Will the timing of the quantitative and qualitative research be sequential or concurrent?
- Will the weighting of the two methods be equal or unequal?
- Will they be mixed by merging, embedding or connecting the data?

Cresswell and Plano Clark (2007)

Consideration of these questions can lead to four distinct mixed method research options (Cresswell and Plano Clark, 2007). Firstly, the triangulation approach is a one phase process which is useful when a comparison or contrast is needed between quantitative and qualitative or qualitative data is needed to corroborate the quantitative data. The embedded design is useful when one set of data is not adequate. In the explanatory design, again a two stage process, qualitative data can account for or add to quantitative data. Finally in the exploratory approach quantitative data can help build on qualitative data.

5.4.2 Quantitative Strategies

Cresswell (2009) suggested two main strategies for quantitative approach. Firstly, survey research that can comprise of cross sectional or longitudinal studies that utilise structured interviews and/or questionnaires as mode of inquiry. The second approach suggested by Cresswell (2009) is experimental research in which the effect of a particular treatment on a group is studied, and clearly this has a wide application in medical science.

The main concerns of quantitative researchers according to Bryman and Bell (2011) are measurement, discovering explanations and being able to generalise findings much more widely the particular sample group: Techniques such as factor analysis and structural equation modelling may be used to measure and identify latent variables, and test measurement and structural models.

5.4.3 Qualitative strategies

The main forms of qualitative strategies suggested by Cresswell (2009) are:

Ethnography

This is mode of inquiry where '...the researcher studies an intact cultural group in a natural setting over a prolonged period of time by collecting primarily observational and interview data' (Cresswell, 2009).

Grounded Theory

Grounded theory was developed by Glazer and Strauss (1967). In this approach, theory emerges from data and is analysed sometimes at the same time in an iterative process, thus employing both inductive and deductive methods.

Case Study

A case study is defined by Yin (1993) as an empirical enquiry that '...Investigates contemporary phenomena within its real life context, especially when the boundaries between phenomena and context are not clearly evident'. Yin (1993) suggests that case studies can be used when the situation is too complicated for experimental methodology, and where outcomes of the investigation are not clear.

In addition, a preoccupation of qualitative researchers highlighted by Bryman and Bell (2011) is that of experiencing the situation from the perspective of the participant, an emphasis on detail and context, an interest in the social process and finally a minimalist approach to structure.

5.5 Choice of Research Approach

5.5.1 Research approaches in knowledge sharing

It is apparent from the literature review that the research focus in knowledge management and knowledge sharing has mirrored the development of knowledge management itself, which has moved from a hard approach where technological systems for sharing knowledge were the prime factors of importance to a softer socio-technical perspective.

It could be argued that that an interpretive approach lends itself to an investigation of factors involved in knowledge sharing such as culture, values and trust. However, a summary of research by Wang and Noe (2010) found that of 76 qualitative and quantitative studies carried out since 1999, only one third were qualitative in nature. A small number did use a mixed methods approach.

Wang and Noe (2010) considered that some quantitative studies suffered from limitations such as failing to measure knowledge sharing objectively and possible shared common method variance. Also some studies combined the sharing and use of knowledge.

5.5.2 Research approach for Thesis

The researcher considers that reality can be viewed as objective with himself as a detached observer. Furthermore, one of the main objectives of this investigation was to generate hypotheses with regard to the influence of different factors on knowledge sharing in higher education. The potential to gain a substantial size of sample also existed. In addition, it was intended that in order to be objective this process should not involve becoming

immersed in one particular department in order to understand for example its values and culture, although respondents are asked objectively about their perceptions on these topics. Furthermore there is an existing body of literature on knowledge sharing factors and this would assist a deductive approach. Thus a positivist strategy employing quantitative methods leading to the proposal of hypotheses was indicated (Easterby- Smith *et al.* 2002)

Conversely the researcher also believes that reality can be viewed as socially constructed and subjective and is himself an academic at one of the universities in the study. Consequently he is an insider whose perspectives of the settings and findings may be quite different from a researcher from the outside (Bartunek and Louis, 1996). This therefore points to the adoption of a qualitative strategy.

However the researcher is primarily a pragmatist who believes that solving the research question takes precedence over an attachment to a particular approach and considers that a measure of objectivity could help define the factors in knowledge sharing which could later be explored using a qualitative strategy. Indeed the effectiveness of using more than one paradigm to investigate a research problem has been illustrated by the use of Burrell and Morgan's multiple paradigms approach (Bryman and Bell, 2011). A quantitative research approach has therefore been chosen for the initial stage of the investigation and this is to be followed by qualitative research.

Cresswell and Plano Clark (2007) defined the *sequential explanatory* mixed method approach as one where qualitative analysis is used to augment and explain relationships discovered during quantitative analysis. This is the strategy chosen in this case where a questionnaire survey is followed by a series of semi-structured interviews to expand upon and inform the relationships discovered in the data collected thus also gaining the benefits of triangulation (Denzin, 1978).

The quantitative approach in this case has consisted of the collection of survey data based on a questionnaire designed by Bock *et al.* (2005). Bock's questionnaire was founded on the theory of reasoned action and was designed to examine the role of extrinsic motivators, social psychological forces and organisational climate in the formation of behavioural intention to share knowledge.

In summary, Bock's study concluded that attitudes to knowledge sharing and organisational climate affected intentions to share, sense of self-worth and organisational climate affected subjective norms and extrinsic rewards that are anticipated have a negative influence on the knowledge sharing attitudes of individual. However the population, which consisted of executives from large commercial organisations in South Korea, was completely different from the one used in the current survey

The advantages of using a mixed methods approach have been discussed in the previous section. In this case quantitative data has informed a qualitative approach as issues arising within the questionnaire are explored in greater richness using semi-structured interviews.

5.6 Research Design

5.6.1 Research Model and Hypotheses

Some key factors that influence sharing were discussed in chapters 3 and 4 have been included in the model and others will be considered in the qualitative stage of the research. In the quantitative part of the research a pre-existing questionnaire was used (Bock et al. 2005) and the factors included reflect Bock's model and thus the Theory of Reasoned Action (TRA). Consequently, organisational factors and beliefs are both affected by the subjective norm that consists of norms and motivation to share. The model displays the hypothesised relationships and is depicted below in Figure 5.2. A list of hypotheses is shown in Table 5.2.

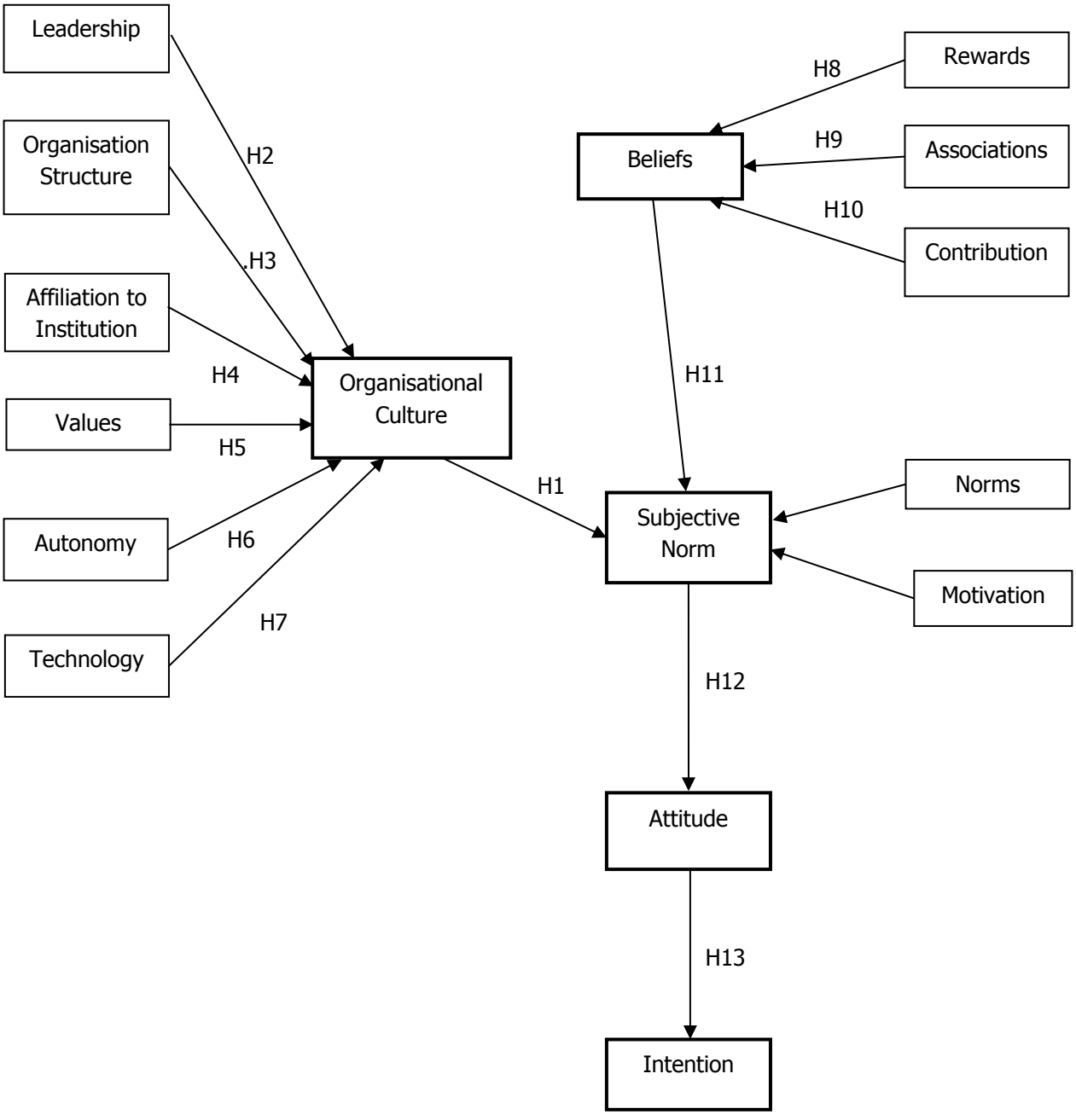

Figure 5.2: Research Model

Table 5.2: Hypotheses

Hypotheses
H1- The stronger the propensity towards knowledge sharing in the organisational culture, the stronger the propensity to sharing knowledge in the subjective norm
H2- The more supportive leadership is towards knowledge sharing, the stronger the propensity towards knowledge sharing in the organisational culture
H3- The more supportive organisational structure is towards knowledge sharing, the stronger the propensity towards knowledge sharing in the organisational culture
H4- The greater affiliation to institution in support of knowledge sharing, the stronger the propensity towards knowledge sharing in the organisational culture
H5- The more supportive values are towards knowledge sharing, the stronger the propensity towards knowledge sharing in the organisational culture
H6- The greater the autonomy in support knowledge sharing, the stronger the propensity towards knowledge sharing in the organisational culture
H7- The more supportive technology is towards knowledge sharing, the stronger the propensity towards knowledge sharing in the organisational culture
H8- The stronger the expectation of rewards, the stronger the propensity towards belief in the value of knowledge sharing
H9- The stronger the expectation of associations, the stronger the propensity towards belief in the value of knowledge sharing
H10- The stronger the desire to contribute, the stronger the propensity towards belief in the value of knowledge sharing
H11- The stronger the beliefs in the possibility of rewards for knowledge sharing, the stronger the propensity to sharing knowledge in the subjective norm
H12- The stronger the propensity to sharing knowledge in the subjective norm, the more favourable the attitude towards knowledge sharing
H13- The stronger the attitude to knowledge sharing, the stronger the intention to share knowledge

5.6.2 Questionnaires

It has been suggested by Hyman et al. (2006) that the use of existing questionnaires is practical and desirable but not always considered by researchers due to feelings that originality is the critically important. Bryman and Bell (2011) also pointed out significant advantages of using existing questions from existing surveys. First of all they have been piloted and some data regarding measurement and validity will already be available and in this case research results had been widely cited by other researchers exploring knowledge sharing. Secondly, comparisons with other research are possible. In this case the original questionnaire used by Bock et al. (2005) were sent to a range of commercial organisations in Korea that include the Food, Chemical, Pharmaceutical, Automotive and Electricity and Gas sectors. Data was also obtained by interview from the Chief Knowledge and Chief Information Officers of the organisations involved.

This research and questionnaire constructs have been widely cited and used in the development of other questionnaires (Kankanhalli et al. 2005; Chiu at al. 2006; Petter et al. 2007; Lin, 2007). However, Bock et al. (2005) admitted that the collective nature of Korean culture is identified as a research limitation when comparisons are to be made with similar studies. Consequently some questions that were not used as originally written needed to be developed for the academic context. Also, in some cases for example the wording needed to be changed for reasons of clarity which were raised by the translation of the original questionnaire from Korean to English. However, Czaja and Blair (2005) pointed out that because the questions worked well with one sample of respondents it should not be assumed that they will work equally well with another group. This highlights the important of piloting the survey and this process is discussed later in the Chapter 5. In summary, however, it was felt that the benefits of using a robust tested instrument outweighed the advantages of producing an original questionnaire. Constructing a new questionnaire would have involved piloting on a much larger scale which would have been difficult because of

access problems. In addition the existing questions have been subject to a validity testing procedure during the structural equation modelling process where reliability and construct, discriminant and convergent validity had been clearly established, thus knowledge sharing factors were accurately measured.

Questionnaires also have many generic advantages as a survey method as highlighted by Gillham (2007) and all of the following factors applied to the survey conducted for this thesis:

- Low cost in time and money.
- Easy and quick to collect information from many respondents.
- Respondents can complete the questionnaire at their time
- Convenience.
- Analysis of answer to closed questions is straightforward.
- Less pressure for an immediate response.
- Respondents' anonymity can be assured.
- Eliminate interviewer bias.
- Standardization of questions.
- Can provide suggestive data for testing a hypothesis.

(Gillham, 2007)

Bryman and Bell (2011) did however suggest that questionnaires have some significant drawbacks such as the inability to prompt a respondent who is unable to answer a question and the lack of opportunity to ask a follow up question to increase understanding. They also felt that the chance for the recipient to read the questionnaire prior to completion compromised the idea that they should be answered in a set order. In addition they thought that missing data could be problem. In the case of this research lack of understanding is addresses by the piloting process and the use of an existing questionnaire. The shortage of follow-up question opportunities is redressed

to some extent by the semi structured interview process in which factors and relationships can be explored further. Finally small amount of questionnaires with a substantial amount of missing data were discarded as part of the SPSS data collation process.

Cameron and Price (2009:337) suggested that a questionnaire approach is useful in the following circumstances:

- Resources are limited
- Data needs to be collected from a large number of people
- It is likely that the researcher will be able to contact the subjects and that they will consent to fill in a questionnaire
- The researcher already knows what questions need to be asked
- The researcher is confident that the questions will be understood without difficulty

Cameron and Price (2009)

In this particular case, the project was constrained by time and cost, and data needed to be collected from a large number of respondents who are themselves geographically dispersed. Contact details were largely available via the university websites. The questions to be asked had been decided and in many cases used, and understood, in a previous survey. Consequently, a questionnaire seemed a logical course of action for the first stage of the research. In addition, Gillham (2007) suggested that questionnaire results can inform further research by illustrating which areas can be pursued, developed and brought to life by, for example, the use of semi-structured interviews as part of a mixed methods approach.

The survey in question was intended to measure the attitudes and intentions of academics rather than managers in the commercial worlds and consequently some dimensions particular to the academia have been added. The sources of the questions are shown below:

Table 5.3: Sources of Survey Questions

Variable	**Items**	**References**
Types of knowledge shared		
Intention to share knowledge	4 items	Bock et al. (2005)
Expected rewards and associations	10 items	Bock et al. (2005)
Expected contribution	5 items	Bock et al. (2005)
Normative beliefs	5 items	Bock et al. (2005)
Attitude	4 items	Bock et al. (2005)
Autonomy	4 items	Bock et al. (2005)
Affiliation to institution *dept*	5 items	Bock et al. (2005) Lee (2007)
Affiliation to discipline*	4 items	Lee (2007) Cronin (2000)
Innovativeness	4 items	Bock et al. (2005)
Leadership*	6 items	Politis (2001) Oliver and Kandadi, (2006)
Values *	5 items	McAdam and Creedy (2001)
Structure*	4 items	Malholtra and Segars (2001) Gold et al. (2001)
Motivation to comply	3 items	Bock *et al.* (2005)
Technology platform	6 items	Kim and Lee (2006), Handzic (2011)

Sections that were not present on the original questionnaire (Bock et al. 2005) have been marked with an asterisk.

Although Bock's study was utilised as an existing valid and reliable instrument, the research in this thesis was performed in completely different geographical and cultural context. Consequently it represents an extension to the existing questionnaire where some questions needed rewording to relate to the new context whilst some others added that were based on the literature discussed in Chapters 3 and 4. Lee (2007) both cited a tension between affiliation to institution and to discipline that was evident in her 2007 survey of academics whilst Cronin (2000) suggested academics first loyalty was to their discipline. Consequently it was felt appropriate to insert a question on affiliation to discipline. Sections on leadership, structure and

values were not included on Bock's questionnaire and have been constructed to reflect a wide range of literature that confirms the influence of these factors directly on sharing behaviour and on organisational culture in general (Politis ,2001; Oliver and Kandadi, 2006; McAdam and Creedy, 2001; Malholtra and Segars, 2001). The technology section questions that featured in Bock's questionnaire were replaced to reflect the importance of user friendly collaborative technology in a sociotechnical system (Kim and Lee, 2006; Handzic, 2011). The objective was to collect data from different departments within a number of different universities which will be sufficient to generalise the findings. This supports a positivist approach using quantitative data as does the availability of literature in the field of knowledge sharing and knowledge management (Saunders, 2009).

The Theory of Reasoned Action on which Bock's (2005) questionnaire is based (Fishbein and Ajzen, 1975) suggests that beliefs, attitudes and intentions and behaviours can be measured objectively, and this again supports the quantitative deductive approach.

All items were measured using 7-point Likert scales in which 1= 'strongly disagree' and 7 = 'strongly agree', with the exception of the initial section on types of knowledge. In this case a 5 point scale was used and possible response categories were 'never', 'seldom', 'sometimes', 'often' and 'always'. In addition, the questionnaire included a contextual question related to the types of information that academics share, and demographic data including: university, department, length of time in universities (within current department, and also total career-length), position, and gender.

Robson (1993) suggested that Likert scales look interesting to respondents and consequently respondents are more likely to enjoy completing this type of questionnaire. Tittle et al. (1967) also pointed out that the Likert scale is the most widely used scaling method and tends to be more reliable than other methods. A seven point scale was used which featured a neutral point (neither agree nor disagree) in the centre of the scale. Opinions have varied

on the desirability of a neutral response choice because it has been argued that the lack of a neutral choice could force the respondent to make a decision. However, a study undertaken by Worcester and Burns (1975) discovered that respondents tended to give more positive responses when the mid-point is left out. Furthermore, Dumas (1999) suggested that stopping the respondents from remaining neutral could reduce the reliability of the scale. Using a seven point scale has in any case decreased the importance of the midpoint issue because Matell and Jacoby (1972) showed that the use of the midpoint option decreases as the number of choices increases. The rating scale then enabled the creation of a rating scale on SPSS software which then allowed factor analysis to take place (Oppenheim 1992).

When constructing the questionnaire and conducting the pilot process, the following guidelines suggested by Czaja and Blair (2005) were taken into account:

A. Does the survey measure some aspect of the research question?
B. Will the respondents understand the question and in the same way?
C. Will the respondents have the information to answer it?
D. Will the respondents be willing to answer it?
E. Is other information needed to answer this question?

Czaja and Blair (2005)

Some Heads of Department refused to give permission for their staff to be surveyed often citing work pressure as the reason for refusal. Consequently, a stratified sample was not possible and the data collected was essentially in the form of a convenience sample which is a form of non-probability sampling. Fricker and Schonlau (2002) suggested that a convenience sample can have particular advantages such as helping to develop research hypotheses and recognising issues whilst Wellington (1996) pointed out that

this type of sampling can help to accomplish research that would not otherwise be possible due to lack of access.

5.6.3 Piloting

Hussey and Hussey (1997) suggested that it is critical to pilot the questionnaire prior to its distribution. The most important reasons for this suggested by Czaja and Blair (2005:103) are firstly to check that the '... questionnaire works in the manner intended by the researcher, providing valid and reliable measures of the attitudes behaviours and attributes of interest.'

The questionnaire was given to six academics working at the Crewe Campus of Manchester Metropolitan University. The respondents indicated that they understood the existing questions but were unsure of which type of knowledge they were meant to be considering in their answers. Consequently, in order to orientate the respondents to consider types of knowledge that could be shared prior to answering the rest of the questionnaire a new question was inserted before the others ('How often do you share the following types of knowledge?'). This provided a scale of responses for sharing the following types of knowledge:

- Research information and activities
- Teaching and learning resources and practice
- University processes and procedures
- Social and work news

Negatively questions were inserted into the final questionnaire in order to combat the acquiescence effect which refers to the general propensity of respondents to give positive answers to questions irrespective of content (Messick, 1967). It was also suggested by pilot respondents that the questionnaire was made available in electronic form and this was subsequently achieved using Survey Monkey questionnaire software.

Internet surveys have the advantages of low cost and geographical reach as well as speed of data collection (Czaja and Blair, 2005). Also the data collected can be formatted into an Excel spreadsheet and moved directly into SPSS to facilitate factor analysis. Also, the use of radio buttons makes such surveys simple to complete, and questionnaires cannot be invalidated by the respondent ticking more than one box.

5.6.4 Questionnaire Distribution

Some Heads of Department refused to give permission for their staff to be surveyed often citing work pressure as the reason for refusal. Consequently, a stratified sample was not possible and the data collected was essentially in the form of a convenience sample which is a form of non-probability sampling. Convenience sampling is based on the accessibility and availability of respondents and as such it is difficult to generalise findings to the entire population. However, convenience sampling is widely used in business research because of the costs and difficulties generated by probability sampling (Bryman and Bell, 2011). In addition, Wellington (1996) pointed out that this type of sampling can help to accomplish research that would not otherwise be possible due to lack of access.

The following table shows the number of questionnaires sent and those returned from different disciplines. Discipline titles conform to the classification used by the Higher Education Academy.

Table 5.4: Questionnaires Sent and Returned by Discipline

Discipline	***Sent***	***Returned***	***Percentage Response Rate***
Arts and Humanities	1247	101	8.10
Science and Technology	841	104	12.37
Social Sciences	452	112	24.78
Total	2540	317	12.48

A much higher return rate was displayed by Social Science academics who returned just under 25% of the questionnaires whilst Arts and Humanities respondents returned only just over 8%. Science and Technology academics were slightly more responsive, returning over 12% of questionnaires sent to them. However it was observed from their profiles that many Arts and Humanities respondents had jobs in the media as writers, broadcasters and practicing artists. This could be one explanation for the low response from this discipline.

Skowronek and Duerr (2009) suggested that convenience samples can be made more representative of the total population by managing and monitoring the process of collecting data. Consequently in convenience sampling repeated instances of questionnaire distribution are necessary in order to achieve a sample considered adequate. However, according to Saunders et al. (2009) there are no conventions for assessing sample size required in convenience samples and Patton (2002) suggested that the most important considerations are how valuable and credible the findings might be coupled with resource considerations. A further factor was the intention to use Structural Equation Modelling in order to model and test relationships and for this purpose a minimum of 150 is required (Anderson and Gerbing, 1988)

In the research for this thesis, it was not possible to survey a sufficient number of academics in order to gather a representative sample of each department due to access difficulties, so in the interests of credibility, broadly equal proportions of replies from Arts and Humanities, Science and Technology and Social Sciences were collected. These were collected from 19 departments and again a broadly equal number of departments for each discipline have been surveyed. However not all departments from the HEA classification appear because of access difficulties.

Arts and Humanities: Art and Design, English, History, Languages, Linguistics and Media Communications.

Science and Technology: Built Environment, Computing, Engineering, Mathematics, Physical Sciences and Psychology.

Social Sciences: Business and Management, Education, Hospitality, Interdisciplinary Studies, Law, Sociology and Sport and Tourism.

A balance between pre-92 and post-92 universities was also attempted. However time and resources were also important considerations particularly as the process took longer than anticipated due to the number of non-responses and the final total of completed questionnaires used in the survey was 317. The total response rate was 12.48% although response rates varied significantly between the disciplines although as Table 5.5 shows there was a high percentage of returned questionnaires from Social Sciences compared with other two disciplines.

5.6.5 Demographics of Respondents

Responses from the three disciplines showed a broadly equal distribution, although Social Sciences numbers were slightly higher than the other two. In contrast in the classification of university types there were approximately twice as many responses from pre 92 universities compared with post 92 universities. Gender distribution showed an acceptable balance; just over 60% of the survey population were men and just under 40% women.

Nearly 40% of the sample has worked in their respective departments for less than 5 years and this figure decreases progressively to a proportion of 5.2% who have worked in their department for over 26 years. However, a totally different picture emerges when the number of years in higher education is considered. The table and chart shows a much more even spread throughout the sample. The 0-5, 6-10, 11-15 and 16-20 categories

are broadly even at between 17% and 21% whereas the 21-25 categories are 8%. The above 26 category is just below 15%.

Senior Lecturers made up by far the most substantial section with regard to departmental position, whilst a further 17% were Professors, and 25% were Lecturers. Researchers and Associate or Part-time lecturers make up 11% of the total respondents, and researchers consist of just over 5% of these although clearly respondents in other categories would perform research as part of their role.

Table 5.5: Demographic Statistics of Respondents

Demographic Characteristics	***Number of responses***	***Percentage***
Disciplines		
Arts and Humanities	101	31.9
Science and Technology	104	32.8
Social Sciences	112	35.3
Classification of Institution		
Pre- 92		
Post- 92	215	63.6
	123	36.4
Gender		
Male	219	60.5
Female	143	39.5
Number of years in the department		
0-5	130	37.9

6-10	87	25.4
11-15	46	13.4
16-20	41	12.0
21-25	21	6.1
Above 26	18	5.2
Number of years in higher education		
0-5	60	17.5
6-10	73	21.3
11-15	68	19.8
16-20	63	18.4
21-25	30	8.7
Above 26	49	14.3
Position in department		
Senior Lecturer, Lecturer	256	71.9
Researcher	19	5.4
Associate or Part-time Lecturer	20	5.7
Professor	60	17.0

5.6.6 Interview Design

In keeping with the sequential mixed methods approach. Cresswell (2009) , the semi-structured interviews have been used to develop themes that emerged from the questionnaire findings, to discover what barriers to

knowledge sharing are important to academics and to elicit suggestions for improving knowledge sharing.

5.6.7 Interviewee sample

Respondents from the original questionnaire survey were asked to provide contact details if they were prepared to be interviewed. However the distribution of volunteers did not necessarily reflect the three disciplines, consequently in order to achieve representativeness amongst these disciplines, and to set up comparisons purposive sampling was used. Purposive sampling techniques are described by Teddie and Yu (2007) as a mixed method sampling technique where the selection of cases is on the basis of those that will provide the most useful information and some generalisability. According to Wellington (1996), purposive sampling also '...can be valuable in following up contacts, checking data from similar organisations and generally exploring the field'. In addition, in purposive sampling, the number of cases is generally small (30 at most), and selection utilising expert judgment. Thus interviewees were chosen on this basis utilizing the inside knowledge of the researcher.

5.6.8 Choice of interview approach

In keeping with the explanatory approach detailed by Cresswell and Plano Clark (2007), a series of interviews were conducted. Structured interviewing was considered but this approach is firmly rooted in the quantitative approach to data collection along with questionnaires and experiments (Cresswell, 2009; Saunders, Lewis and Thornhill, 2009). This approach involves all recipients being asked the same question in the identical context normally in a closed format that lacks flexibility (Denzin and Lincoln, 1998).However such a format can facilitate coding of the data in for entry onto a database (Bryman and Bell, 2011). Smith and Osborn (2008) suggested that despite the undoubted advantages of structured interviewing such as dependability, swiftness and the ability to monitor the process some important points may be missed out due to the constraints of the process.

They also assert that a structured interview is similar to answering a questionnaire except that it is the interviewer who completes the questionnaire rather than the respondent.

In contrast, unstructured interviewing is qualitative in nature, open ended and often involves participant observation, and consequently it is a tool much used by ethnographers (Denzin and Lincoln, 1998; DiCicco-Bloom and Crabtree, 2006).However because of the limited time available to interview academics and lack of opportunity for participant observation, this type of interviewing strategy was also rejected.

Semi-structured interviewing involves asking a broadly similar range of questions to each interviewee but the list of questions is more of a guideline than a constraint (Smith and Osborn, 2008). It is associated with the qualitative approach due to the more open nature of the questions and the greater amount of freedom given to the interviewer to digress, change the order of the questions and pursue themes that arise during the interview (Bryman and Bell, 2011). Smith and Osborn (2008) summarised the strengths of the semi-structured interview in this way. 'It facilitates rapport/empathy, allows a greater flexibility of coverage and allows the interview to go into novel areas, and it tends to produce richer data'.

Coolican (1999) recommended that the semi-structured interview can serve as a guide for the interviewer rather than being a set schedule as in the structured interview format, thus permitting digression to other topics that may be related. These strengths coupled with the need for qualitative research as part of the mixed method strategy suggested that the semi structured approach was the most suitable for this stage of the research. Work constraints for academics and the access permissions needed to conduct an ethnographic approach also mitigated in favour of a semi structured approach.

Semi-structured interviewing is also favoured by Mercer (2007) when interviewing as an insider due to the restrictive nature of structured interviewing. Insider statues can lead the both parties to assume opinions on some issues as well as failing to address sensitive issues and ask questions that appear to be obvious (Hockey, 2006). However, Mercer (2007, p8) felt that the insider position was '...a double-edged sword' because their contextual familiarity could be considered more credible and encourage more openness from interviewees.

5.6.9 The interview itself

According to DiCicco-Bloom and Crabtree (2006) it is important to develop a rapport quickly once the interview stars in order establish respect and trust. This will enable the interviewee to feel comfortable sharing their personal experiences. Responses can be given by the interviewer that echo the words used by the interviewee in order to convey a request for further elucidation. The researcher used such a technique during the interviews and it proved very successful.

Kvale and Brinkmann (2009) suggested a number of points to keep in mind during the interview itself. First of all, the interviewer has the opportunity to ask direct questions from the outset or divulge the object of the interview afterwards. In this case the purpose of the interview was explained and a sequence of direct questions was asked sometimes with supplementary questions to enhance understanding. Interviewees were already in possession of some understanding of the topic due to their prior participation in the quantitative process. Secondly, Kvale and Brinkmann (2009), some clarification of meaning was requested with regard to factors affecting knowledge sharing for the purposes of subsequent thematic analysis, and the necessity to elucidate knowledge relevant to the themes was kept in mind throughout the process. Finally, the importance of promoting positive communication during the interview was stressed. Kvale and Brinkmann (2009) felt that question should be concise and free from academic jargon.

Accordingly interview questions have been kept succinct and to one sentence and if any clarification is required this can be accommodated within the semi-structured format.

The insider status of the researcher was another feature of the interviews. Miles and Huberman (1994) considered insider effects as part of three main types of bias that can occur in a qualitative interview situation. The three types are as follows:

- The holistic fallacy where patterns that do not exist are attributed to data

- Elite bias is where data from interviewees with high status is given more importance than it merits

- Going native or not keeping your sense of perspective and being influenced into accepting the explanations of locals

Accordingly reliance on accessible and elite interviewees leads to sampling non-representative employees (Miles and Huberman, 1994). For this reason purposive sampling, where a selection of academics with different status at various types of universities, has been employed. This in turn will aid generalisability. Miles and Huberman (1994) also suggested that the purpose of the interview and future use of the data is made clear at the outset and that some form of triangulation should be considered. In this survey clear explanations were given to the interviewees and triangulation will be achieved by synthesising the results of the questionnaire survey with the interview data.

With regard to going native, Kanuha (2000) pointed out that being an insider researcher improves the depth of understanding of the context and ease of

acceptance. However objectivity and is called into question because of the researcher's closeness to the research project. In particular it was important that as an insider this researcher should pursue a line of questioning to its conclusion rather than taking points as understood due to internal knowledge (Dwyer and Buckle, 2009), and that the values and attitudes of the researcher should not come into the conversation. The use of semi-structured interviews has tempered that problem because incomplete answers can be subject to supplementary probing questions.

5.6.10 Technical Issues

Interviews at universities within reasonable travelling distance were carried out on a face to face basis. According to McCoyde and Kerson (2006) this type of interview gives '...richer non-verbal data about dress, mannerisms, social cues, tonal quality' and have been regarded as the gold standard of qualitative interviewing However, time, resource and geographical considerations made it impractical to conduct all interviews by this method. Instead, Voice Over Internet Protocol (VOIP) was used, in this case by utilising Skype. Hay-Gibson (2009) summarised the benefits and disadvantages of using Skype in the following table:

Table 5.6: Advantages and disadvantages of VoIP interviewing

Advantages	***Disadvantages***
Costs – Free using PC-to-PC calls, calls to landlines may be made at a small cost *Human element* – Participants and viewer able to see each other and read face and body language in video calls *Recordable* – Audio recordings can be made of the interview session	*Technology requirements* – Internet access needed by the calling party (VoIP to landline) and for both parties when calling PC-to-PC. VoIP-enabled program must be installed at both ends for PC calls, as well as microphones and cameras for respective audio and video inputs. *Human element* –Participants may feel embarrassed or nervous to be on camera

Source: Adapted from Hay-Gibson (2009)

Clearly, non-verbal cues and mannerisms can be observed in Skype as in a face to face situation and a recording was made of all Skype interviews. The technology was readily available and the interviewees were themselves frequent users of Skype and consequently felt comfortable and relaxed in front of the camera.

Rubin and Rubin (2005) pointed out that a permanent record of the interview is critical and a digital recorder was used for this purpose. The transcription process for each interview was in excess of two hours. Sometimes phrases and accents were unclear so repeated playback of certain sections was necessary to ensure accuracy.

According to DiCicco-Bloom and Crabtree (2006), the recording should be transcribed with absolute precision and they made reference to the amount of time needed to achieve accuracy in this task. A list of the questions that were asked in the substantive study along with the literature that informed their inclusion and their associated prompts is shown below in Table 5.7. As suggested by Coolican (2000) the list of questions acts to some extent in this case as a topic guide for the interviewer thus facilitating a degree of flexibility in keeping with the exploratory mixed methods approach (Cresswell and Plano Clark, 2007). The interview time was approximately 30 minutes although this varied somewhat due to the length of answers supplied.

Table 5.7: List of interview questions and sources

Semi-Structured Interview Guide	
Questions	*Sources*
1. Describe a recent incident where another academic requested knowledge from you. Which factors did you consider important when considering this request?	Riege (2005) Nahapiet and Ghoshal (1998)
2. What in general affects the level of knowledge sharing within your department?	Riege (2005) Lee (2007) McDermott and O'Dell (2001)

3. Describe the ways in which you share your knowledge. Are different types of knowledge shared in different ways?	Hansen et al. (1999) Radaelli et al. (2011)
4. Describe the leadership style within your department. What effect does this have on knowledge sharing activities?	Yielder and Codling (2004) Lumby (2012)
5. Do feel that your Head of Department expects you to share your knowledge? If yes, how is this expectation communicated?	Connelly and Kelloway (2003) Srivastava et al. (2006)
6. Which rewards for sharing your knowledge do you value the most?	Bock et al. (2005) Lin (2011) Hislop (2009)
7. Suggest ways in which your University can encourage knowledge sharing?	Howell and Annansingh (2013)
8. Why do you think moves to encourage knowledge sharing may be resisted?	Tippins (2003) Cronin (2000) Riege (2003)
9. Describe the culture and structure within your department. What effect do these have on knowledge sharing? (How can these be improved?)	Dopson and McNay (1996) Lee (2007)
10. Describe the collaborative technology that links you to others in the department. (How could this be improved?)	Jarvenpaaa and Staples (2005) Noble (1998)
11. Do you belong to a community of practice? (If yes, in what ways does this affect your knowledge sharing activities?)	Wenger and Snyder (2000) Hildreth and Kimble (2004)

Questions 1 and 2 were intended to orientate the interviewee towards considering knowledge sharing factors that could be enlarged upon later and to also introduce the terminology surrounding those factors. Questions 3 was intended to expand on the first group of questionnaire questions which identified the types of knowledge shared and discover the extent to which

face-to-face and virtual means of communication were utilised. Questions 4, 5, 6, 9, 10 and 11 were intended to explore critical knowledge sharing factors identified in the literature in greater depth than possible in a questionnaire, whilst Questions 7 and 8 were expected to draw on the interviewees own experience to identify barriers and improve sharing behaviour.

5.7 Ethical Issues

There are a number of factors to take into account when undertaking a project of this kind. Wellington (1996) lists several unethical practices to be avoided.

- Involving people without their knowledge or consent
- Coercing them to participate
- Withholding information about the true nature of the research
- Exposing participants to physical or mental stress
- Invading privacy;
- Taking too much time
- Not treating participants fairly or with consideration or with respect
- Failing to maintain confidentiality/anonymity

Wellington (1996) Adapted from Robson (1993)

In the case of this research great care was taken not to carry out any of the above practices. Consent to distribute questionnaires was in the first instance obtained from the Head of Department at each university in the study. The request for access contained a brief explanation of the research. Sometimes more detailed information was requested and this was immediately provided. If access was granted, actual participants were sent an email, again containing a brief explanation of the research, and an assurance of confidentiality and anonymity.

In the qualitative stage of the research, interview participants were taken from a list of questionnaire respondents who had indicated their willingness to take part in a more detailed follow-up research activity. Prospective interviewees were contacted by email which contained a reminder of the purpose of the research and estimated interview duration so that they would feel that too much time was taken up at the actual interview. Interviewees were asked for permission to record the interview prior to it taking place and reminded not to answer any question that they may feel uncomfortable with.

Ritchie and Lewis (2003) have noted how interview participants can become too comfortable during an interview and may later regret giving out information, and for this reason it is important to maintain anonymity and confidentiality. Consequently prior to the interview, interviewees were given an assurance that their comments and identity would remain anonymous in this thesis and in any other future research publication.

5.8 Reliability and Validity

Quantitative Research

Face validity of the questionnaire was established by the piloting process. A robust research model was established through questionnaire data analysis utilising SPSS and Structural Equation Modelling. Those processes were subject to validity and reliability tests which are described in Chapter 7.

Qualitative Research

The relevance of using concepts of reliability and validity as applied to quantitative research in qualitative research has been widely questioned (Smith, 1984; Guba and Lincoln, 1985). Burke Johnson (1997) suggested the use of triangulation, peer review, participant feedback and pattern matching were appropriate strategies to establish the validity and of such research. In

this thesis a mixed methods approach has achieved triangulation, peer review has been performed with informed colleagues, participant feedback has been gathered as part of the semi-structured interview process and themes have been developed by a process of pattern matching. The issue of insider bias has been discussed earlier and every effort has been made to minimise its effects.

Summary

This chapter started by exploring broad philosophical research approaches beginning with positivism then examining post-positivist approaches such as constructivism. The merits of quantitative and qualitative research methods were then considered before an explanatory mixed methods approach, where a questionnaire survey preceded interviews, was chosen and developed. The questionnaire was based on a pre-existing questionnaire that utilised the theory of reasoned action. Some adaptation to the higher education context was required so some additional sections were written. A convenience sampling approach was then justified by access difficulties. Semi-structured interview questions were developed with regard to the need to orientate the interviewees and gain further insight into key knowledge sharing factors. This was followed by a discussion of validity and reliability issues. The next chapter will examine the findings of the descriptive statistics obtained from the results of the questionnaire survey.

Chapter 6

Descriptive Statistics

This chapter describes the first stage of the research and explores the descriptive statistics that have been generated from the responses to the questionnaire that was sent to a selection of UK academics. The construction of the questionnaire and source of the questions has already been discussed in Chapter 5. A copy of the questionnaire can be found in Appendix 1.

First of all demographic details of respondents are provided and then the types of knowledge shared by academics are classified and discussed. Questionnaire data on organisational and individual factors influencing knowledge sharing is then presented in table form and discussed.

6.1 Data Collection

Survey Data was collected from 317 respondents in total and collated into SPSS. A seven point Likert scale was used in all but the first set of questions where a five point scale was used. Cohen, Mannion and Morrison (2007) suggested that the inclusion of negatively worded questions is the usual method of ensuring that questions were read carefully by participants. This procedure has been followed in this questionnaire and negative questions are marked with an asterisk. The results have been inverted as suggested by Pallant (2010) to facilitate comparison of percentages and means, and in

these results both positive and negative questions for particular variables do demonstrate consistency.

6.2 Descriptive Statistics of Questionnaire Responses

The first group of questions on the survey (1-4) are intended to determine the types of knowledge respondents are thinking about when answering the remainder of the survey and utilised a five point Likert scale. A seven point scale was used for the remaining questions.

The choices for each question were: ***1= Strongly Disagree, 2=Disagree, 3=Slightly Disagree, 4= Neither Agree nor Disagree 5=Slightly Agree, 6=Agree, 7=Strongly Agree***

Results are presented as percentages of responses. There are no results for the innovation section

6.3 Types of knowledge shared

Table 6.1: Types of Knowledge Shared Results

Profile of responses 1= Never 2=Seldom 3=Sometimes 4=Often 5=Always								
		Mean	**SD**	**1**	**2**	**3**	**4**	**5**
K1	Research information and activities	3.59	.93	3	8.4	28.7	46	13.5
K2	Teaching and learning resources and practice	3.59	.90	2.5	7.2	32.1	44.3	13.1
K3	University processes and procedures	3.21	1.02	6.3	16.5	34.2	34.2	8.0
K4	Social and work news	3.35	.99	3.8	16.5	30.4	38.4	10.1

In general, academics share all types of knowledge, with most of the responses to every question in this group being in the 'sometimes' and 'often' categories. However, knowledge on research information and

activities and on teaching and learning resources and practice are shared more frequently than knowledge about university processes and procedures, and social and work news (see Table 6.1 above). For example 59.5% of respondents 'often' or 'always' share knowledge on research information and activities, and 57.4% 'often' or 'always' share knowledge on teaching and learning resources and practices. This high level of focus on teaching and learning and research is not surprising. It does, however, suggest that when responding to the other questions in the questionnaire, respondents were thinking about sharing knowledge in all four categories, but with research and teaching and learning knowledge in the forefront of their thoughts.

6.4 Dependent Variables: Attitudes and Intentions

Table 6.2: Attitude to Sharing Knowledge Results

		Mean	SD	1	2	3	4	5	6	7
A1 *	I do not enjoy sharing my knowledge	5.94	1.65	4.7	2.5	3.0	6.9	5.2	22.1	55.5
A2	Sharing my knowledge with other organisational members is a valuable experience	5.96	1.34	1.9	1.1	2.7	7.1	14.3	26.2	46.6
A3	Sharing my knowledge with other organisational members is a wise move	5.60	1.39	1.6	2.5	2.5	15.1	14.3	34.1	29.9
A4	I share my knowledge in an appropriate and effective way	5.58	1.30	1.4	1.9	2.8	14.6	13.5	42.1	23.7

*(*denotes negatively worded questions)*

In general, respondents have a very positive attitude towards knowledge sharing as depicted in Table 6.2 above. For example, 72.8% either 'agree' or 'strongly agree' that sharing their knowledge with others is a valuable experience, whilst 64% either 'agree' or 'strongly agree' that sharing their knowledge is a wise move. Many (65.8%) also felt that they shared their knowledge in an appropriate and effective way. Indeed, 82.8% disagreed with the statement 'I do not enjoy sharing my knowledge', hinting that knowledge sharing was viewed as an enjoyable experience.

Table 6.3: Intention to Share Knowledge Results

		Mean	SD	1	2	3	4	5	6	7
I1 *	I have no intention of sharing my knowledge with more departmental members	6.26	1.48	3.0	2.2	1.9	5.0	5.0	11.8	71.1
I2	I intend always to provide my knowledge at the request of organisational members	5.78	1.64	4.1	4.7	2.8	5.0	7.7	32.6	43.1
I3 *	I intend to share my knowledge with other organisational members less frequently in the future	5.92	1.57	2.2	3.3	2.8	13.3	4.4	18.5	55.5
I4	I intend to share my knowledge with any colleague if it is helpful to the organisation	6.05	1.52	3.3	2.5	1.9	6.6	6.4	22.4	56.9

*(*denotes negatively worded questions)*

These positive attitudes appear to have been translated into strong positive intentions with regard to knowledge sharing as shown in Table 6.3 above, and few have any intention to reduce their knowledge sharing in the future. 75.7% either 'agree' or 'strongly agree' that they intend to provide their knowledge when requested to do so by colleagues, and 79.3% also affirm that they will share knowledge if it is helpful to the organisations. Furthermore, the percentages of respondents disagreeing with either of the statements on intentions are very small.

6.5 Rewards, Associations, Expected Contribution and Beliefs

6.4.1 Rewards and Associations

Table 6.4: Expected Rewards and Associations Results

		Mean	SD	1	2	3	4	5	6	7
R1 *	I am less likely to be considered for interesting and prestigious projects if I engage in knowledge sharing	6.01	1.51	1.7	2.5	3.6	12.7	4.4	15.7	59.4
R2	I am more likely to be considered for internal promotions if I engage in knowledge sharing	4.83	1.70	6.1	5.2	4.4	29.0	13.8	22.1	19.3

Table 6.4 (continued)

		Mean	SD	1	2	3	4	5	6	7
R3	I am more likely to be considered for appointments in other universities if I engage in knowledge sharing	5.27	1.45	2.5	2.5	1.4	27.5	13.9	29.4	22.8
R4 *	I am less likely to be given the opportunity to attend conferences and other events if I share my knowledge	6.08	1.40	1.9	.8	2.2	12.7	5.5	18.5	58.3
R5	My knowledge sharing would strengthen the ties between existing members and myself in the organisation	5.93	1.20	.8	.6	1.9	10.0	16.1	29.6	41.0
R6	My knowledge sharing would get me well-acquainted with new members in the organisation	5.89	1.16	0.8	1.7	0.6	6.6	21.5	33.1	35.8
R7	My knowledge sharing would enable me to associate more with other members in the organisation	5.85	1.21	1.4	1.1	0.6	8.9	19.5	33.1	35.4
R8 *	My knowledge sharing would not result in colleagues sharing their knowledge with me.	4.84	1.61	3.1	6.4	8.9	25.6	15.0	23.9	17.2
R9	My knowledge sharing would create strong bonds with members who have common interests in the organisation	5.75	1.18	0.8	1.1	1.4	9.9	23.1	32.8	30.9
R10 *	My knowledge sharing activities would not improve my sense of self worth	5.12	1.78	5.8	4.2	4.4	20.3	10.3	22.8	32.2

*(*denotes negatively worded questions)*

This section of the questionnaire attempts to measure respondents beliefs regarding anticipated extrinsic and intrinsic rewards and also their beliefs concerning changes in their relationship with other members of staff. It appears from this part of the questionnaire that academics in general strongly believe that extrinsic rewards will accrue from their knowledge sharing as well as the development of relationships. Table 6.4 above shows that over half (52.2%) of the respondents either 'agreed' or 'strongly agreed'

that they were more likely to be considered for appointments in other universities if they engaged in knowledge sharing, whilst 41.4% either 'agreed' or 'strongly agreed' that knowledge sharing improved the possibility of their being considered for internal promotion.

Responses to the questions on outcomes in terms of expected associations were very positive, with over 63% either 'agreeing' or 'strongly agreeing' to all of the questions concerned variously with strengthening ties with colleagues, being known by new members of staff, extending networks of acquaintances, and creating strong bonds with others who have common interests. Further, the responses to the negative statements (R1, R4 and R10) do not suggest that respondents anticipate any negative consequences of knowledge sharing.

Respondents were also fairly convinced that colleagues would reciprocate their knowledge sharing with 56% in agreement to some extent, although the largest category was 'neither agree nor disagree' at 25.6% (R8). Also, the relatively high level of negative responses to the statement that 'My knowledge sharing activities would not improve my sense of self-worth' imply that many might see knowledge sharing as contributing to their sense of self-worth.

6.4.2 Contribution

Table 6.5: Expected Contribution Results

		Mean	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C1 *	My knowledge sharing would not help others in the organisation to solve problems	5.73	1.50	1.7	4.7	3.0	9.1.	11.1	31.3	39.1
C2	My knowledge sharing would create new business opportunities for the organisation	4.66	1.63	5.3	7.5	4.4	30.6	17.8	20.0	14.4

Table 6.5 (continued)

		Mean	SD	1	2	3	4	5	6	7
C3	My knowledge sharing would improve work processes in the organisation	5.38	1.29	1.1	2.2	2.0	19.6	22.7	31.9	20.4
C4 *	My knowledge sharing would reduce the productivity in the organisation	6.07	1.26	0.8	1.1	1.4	12.2	8.0	24.3	52.2
C5	My knowledge sharing would help the organisation to achieve its performance objectives	5.40	1.30	1.4	1.9	.8	22.4	20.2	31.0	22.2

(*denotes negatively worded questions)

This cluster of question measures respondents' beliefs in the likelihood of an improvement in their organisation's performance as a result of sharing their own knowledge.

Generally, respondents disagreed with the statement in question C1 that knowledge sharing would not help others in the organisation to solve problems. In fact 81.5% disagreed to some extent and of these 39.1% strongly disagreed. More positively, there was some agreement among respondents that their knowledge sharing would help in achieving performance objectives (C2). A total of 52.2% agreed with the statement to some extent, although a significant proportion of 30.6% neither agreed nor disagreed. In contrast 75% of respondents agreed to some extent that their knowledge sharing would create new business opportunities.

The highest strength of feeling appeared in response to question C4, where 76.5% respondents disagreed or disagreed strongly with the assertion that productivity would be reduced by knowledge sharing. There was also a high level of agreement with the statement in question C4 where 73.4% of respondents agreed to some extent that that their knowledge sharing would help the organisation to achieve its performance objectives

6.5 Normative Beliefs

Table 6.6: Normative Beliefs on Knowledge Sharing Results

		Mean	SD	1	2	3	4	5	6	7
N1 *	My Head of Department does not think that I should share my knowledge with other members in the organisation	6.10	1.46	1.4	2.2	.8	16.6	3.3	10.5	65.1
N2	My manager thinks that I should share my knowledge with other members in the organisation	5.68	1.36	0.8	1.4	2.0	21.8	10.3	26.3	37.4
N3	My colleagues think I should share knowledge with other members of the organisation	5.35	1.31	0.6	1.4	2.2	29.1	15.7	26.9	24.1

(*denotes negatively worded questions)

The answers to these questions reflect the positive attitudes and intentions to share knowledge discussed in the previous section. Generally academics in the sample felt that Heads of Department, managers and colleagues supported knowledge sharing. 65.1% of respondents strongly agreed that their Head of Department supported knowledge sharing (N1), although the 16.6% who neither agreed nor disagreed were the second highest category.

There was also a high level of agreement that managers think academics should share their knowledge (N2). Only 4.2% indicated some measure of disagreement but a significant minority of 21.8% neither agreed nor disagreed.

In question 26 which concerned the opinions of colleagues, respondents were much unsure with 29.1% neither agreeing nor disagreeing with the statement. However a broad agreement was indicated by a percentage of 66.7 who indicated some measure of accord.

6.6 Organisational Culture

The following six groupings of questions examine dimensions of organisational culture using the following components: Leadership,

Structure, Technology, Values, Autonomy, Affiliation to Discipline and Affiliation to Institution. These are similar to the original constructs designed by Bock et al. (2005); however, literature suggests that academics also generally have a strong affiliation to the community of their discipline so the affiliation to discipline section has been added to the questionnaire.

Responses to questions on the components of Organisational Culture are generally much more neutral in comparison with those on rewards and contribution.

6.6.1 Leadership

Table 6.7: Leadership Results

		Mean	SD	1	2	3	4	5	6	7
L1	The Senior Management Team holds a position of respect amongst members of my department	4.07	1.94	12.7	16.0	8.8	17.1	16.6	17.1	11.6
L2 *	The opinions of members of my department are not sought and valued by the Senior Management Team	4.32	1.92	9.9	11.6	13.5	15.2	16.3	18.0	15.5
L3	Members of my department have a clear view of the direction of the institution	4.01	1.72	8.3	15.5	16.0	15.5	23.2	14.6	6.9
L4	I can trust my manager's judgement to be sound	4.66	1.89	9.9	9.4	8.1	14.4	15.6	27.2	16.4
L5 *	Objectives are given to me which are often unreasonable	4.56	1.87	5.5	11.6	15.2	15.2	12.7	20.2	19.4
L6 *	My manager shows favouritism towards specific persons	4.82	1.96	7.7	5.5	12.2	23.5	4.7	15.2	31.2

*(*denotes negatively worded questions)*

One example of this is the Leadership section where the above table shows the greatest spread of opinion within the questionnaire. This is illustrated by the largely high standard deviation figures, and the mean for four of the items (including both negative and positive items) being close to the mid-point (4).

There was a fairly even spread of opinions about whether the Senior Management Team holds a position of respect although there was a slight balance in favour of this statement with 45.3% showing some measure of agreement (L1). Similarly, there was a fairly even spread of views concerning the extent to which opinions are valued (L2) as demonstrated by a mean of 4.32 and standard deviation of 1.92. This implied little confidence in the suggestion that management would to seek out and value opinions of academics. Opinions were again fairly evenly distributed in question L5 although there was a greater measure of disagreement with the assertion that unreasonable objectives were sometimes given (52.3%), thus respondents appeared to feel on balance that this was not the case.

Responses to the sixth item (L6) relating to favouritism hinted that some academics feel that specific staff may be receiving more favourable treatment. Although, the largest category of 31.2% did strongly disagree with the statement and a substantial proportion of 23.55 neither agreed nor disagreed. A similar picture was depicted in question L3. Opinions were fairly evenly distributed amongst academics on whether colleagues possessed a clear view of the direction of the institution. Feelings were not strong at the extremities of the scale and the smallest scores were in the strongly agree and strongly disagree category.

Respondents were clearer in their conclusion*s* about their manager's judgement with 57% showing some measure of agreement that it is sound (L4) although a substantial minority of 27.4% disagreed to some extent.

6.6.2 Autonomy

Table 6.8: Autonomy Results

		Mean	SD	1	2	3	4	5	6	7
Au1	Each person can decide his/her own way of working to accomplish tasks	5.18	1.69	3.9	7.5	7.2	8.0	16.9	34.8	21.8
Au2 *	People do not have the freedom to plan their tasks	4.98	1.77	3.9	8.8	12.2	8.3	14.6	31.5	20.7
Au3 *	People do not have the freedom to make major decisions regarding their tasks	4.51	1.85	6.6	11.6	16.3	10.7	12.9	28.7	13.2
Au4	Each person can set his/her own targets	4.59	1.82	6.1	13.6	9.4	10.0	21.1	26.9	13.0

*(*denotes negatively worded questions)*

With regard to autonomy, respondents believe they have a relatively high level of autonomy and 61% agreed that they can set their own targets. Similarly, there was strong agreement that each person can decide how to accomplish tasks with 73.5% agreeing with the statement to some extent (Au1). However, a significant minority of 24.9% agreed to some extent that they lacked freedom to plan tasks although there was still a strong broad disagreement with this statement thus implying that respondents feel that freedom to plan tasks is available (Au2).

There was a much wider spread of opinions in question Au3. The largest category was "agree" at 28.7%, but apart from this opinions were fairly evenly spread thus indicating some ambivalence about the freedom to make major decisions regarding tasks. This indicates a marked difference of view regarding autonomy in relation to planning their tasks when compared to making major decisions. Thus respondents perceived they had the freedom to decide on their targets and how to accomplish them but lacked the ability to influence more major task-related issues.

6.6.3 Affiliation to Institution

Table 6.9: Affiliation to Institution Results

		Mean	SD	1	2	3	4	5	6	7
AI1	Members of my department keep close ties with one another	4.42	1.78	9.6	8.5	11.0	15.7	20.3	25.8	9.1
AI2 *	Members of my department often fail to consider other members" standpoint	3.95	1.76	9.3	14.3	19.2	18.7	12.9	19.0	6.6
AI3	Members of my department have strong feeling of "one team"	4.02	1.82	11.6	11.0	17.9	17.6	16.3	16.8	8.8
AI4 *	Members of my department do not co-operate well with each other	4.54	1.79	6.4	9.7	14.9	12.4	20.4	21.3	14.9
AI5	Members of my department feel a strong loyalty to their institution	4.14	1.69	8.5	11.0	12.7	25.3	19.0	15.2	8.3

*(*denotes negatively worded questions)*

As with Leadership, there was an even spread of opinion in this group of questions and this again was indicated by the high standard deviation figures. 55.2% agreed to some extent that departmental members kept close ties thus indication broad if not entirely convincing agreement (AI1).

A wide spread of opinion in question AI2 indicated that respondents were unsure about whether colleagues considered their standpoints. However responses were at their lowest at the extremities thus indicating the absence of a really high strength of feeling in either direction.

Question AI3 also depicted a broadly even spread of opinion. A higher standard deviation of 1.82 showed that the responses were more evenly spread than in question AI2. All categories were between 11% and 17.9% with the exception of the "strongly agree" category which was 8.8%. Thus departmental members are highly undecided whether there is a strong feeling of "one team" within their departments.

There was a more marked disagreement with the statement regarding lack of cooperation (AI4) where 56.6% indicated some level of disagreement with the statement thus suggesting that respondents considered that members" cooperation was reasonably good.

Many more respondents agreed that there was strong loyalty to the institution with only 32.2% indicating some level of disagreement. A significant minority of 25.3% did however neither agree nor disagree.

6.6.4 Affiliation to Discipline

Table 6.10: Affiliation to Discipline Results

		Mean	SD	1	2	3	4	5	6	7
AD1	Members of my department feel a strong loyalty to their academic discipline	6.02	1.24	0.5	1.9	1.4	9.3	12.4	26.4	48.1
AD2 *	I have very little contact with other academics of the same discipline	5.74	1.72	3.3	3.8	8.2	5.5	9.6	18.4	51.1
AD3	The views of other academics are important to me	6.12	1.17	1.1	0.5	1.9	5.8	12.1	29.4	49.2
AD4 *	Academics in my discipline consider that building and maintaining academic Networks is not a high priority	5.36	1.63	2.7	4.9	5.5	16.2	12.1	28.0	30.5

*(*denotes negatively worded questions)*

Responses to this question were exceptionally strong and respondents generally felt much more positive about of "affiliation to discipline" than "affiliation to institution".

A total of 74.5% agreed or strongly agreed that they felt a strong loyalty towards their discipline (AD1).

Nearly 80% disagreed to some extent with the assertion that they had very little contact with other academics from the same discipline, and out of this total 51.1% strongly disagreed. This implies that academics keep in close contact with others from the same discipline (AD2).

The pattern continued with question AD3 where 78.6% of respondents strongly agreed or agreed that the views of other academics were important to them. Only 3.5% registered any measure of disagreement with this statement.

There was a more even spread of opinions in question AD4. However, 70.6% of respondents still displayed some measure of disagreement with the statement that building and maintaining academic networks is not a high priority. There was however a more marked proportion of 16.2% who neither agreed nor disagreed with the statement. It can therefore be concluded that academics feel reasonably positive about the construction of academic networks.

6.6.5 Values

Table 6.11: Values Results

		Mean	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
V1	The university has a clearly articulated set of values	4.85	1.75	7.4	6.3	7.1	12.4	21.4	30.2	15.1
V2	The values of the university are well known and generally accepted by its members	4.38	1.66	6.6	9.9	12.1	18.7	22.3	23.9	6.6
V3	Employees are valued for their individual expertise	4.48	1.83	9.3	10.2	9.1	13.0	21.5	26.2	10.5
V4 *	Employees are discouraged to ask others for assistance when needed	5.38	1.51	1.1	4.9	4.4	17.9	17.0	25.0	29.7
V5	Employees are encouraged to discuss their work with people in other workgroups	4.75	1.57	3.1	8.6	7.8	20.9	22.3	25.1	12.3

*(*denotes negatively worded questions)*

Respondents were throughout the section were positive towards most questions, thus indicating some measure of understanding with regard to the values of their university and where and from whom they can gain assistance.

Responses were generally positive and respondents largely agreed that the values of their university were clear, with 66.7% indicating some measure of agreement. A mean of 4.38 indicated that respondents were less sure about the statement in question V2 regarding acceptance of values and a total of 28.6% indicated some measure of disagreement whilst 18.7% neither agreed nor disagreed. Respondents were more convinced that they are valued for their individual expertise with 58.2% indicating some measure of agreement with this statement (V3).

71.7% of respondents disagreed with the assertion that they are discouraged to ask for assistance, consequently there is an implication that they feel strongly encouraged to do so when the need arises (V4). There was a general feeling amongst respondents that they are encouraged to discuss their work with those in other workgroups. 59.7% agreed to some extent with this statement of these only 12.3% agreed strongly.

6.6.6 Structure

Table 6.12: Structure Results

		Mean	SD	1	2	3	4	5	6	7
S1 *	The structure of this department inhibits interaction and knowledge sharing	4.41	2.12	7.8	10.3	15.3	15.6	8.9	21.7	20.6
S2	The structure of this department promotes collective rather than individualistic behaviour	3.88	1.61	6.4	18.1	15.0	26.1	15.8	13.6	5.0
S3	The university designs processes to facilitate knowledge exchange across departmental boundaries	3.79	1.75	13.1	16.1	13.3	16.7	22.2	14.7	3.9
S4	The university encourages people to go where they need for knowledge regardless of structure	4.19	1.6	7.5	10.1	10.3	28.8	19.0	19.6	4.7

*(*denotes negatively worded questions)*

In the organisational structure section, responses are much more negative. Only 18.6% either "agreed" or "strongly agreed" that the structure of their

department promoted collective rather than individualistic behaviour (S2), and only 18.6% either "agreed" or "strongly agreed" that their university designed processes to facilitate knowledge exchange across departmental boundaries (S3). Responses were a little more positive with regards to the extent to which they were encouraged to go where they needed for knowledge, regardless of structure with 43.3% registering some agreement, although of these only 4.7% agreed strongly.

A high standard deviation of 2.12 indicates the wide difference in responses to the assertion that the structure of the department inhibits interaction and knowledge sharing. Although there is broad disagreement with the statement and 42.3% either disagreed or strongly disagreed.

6.6.7 Technology

Table 6.13: Technology Platform Results

		Mean	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
T1 *	My organization does not foster the development of "human-centred" information technology	4.21	1.52	5.8	6.7	11.4	44.4	8.3	14.7	8.6
T2	In this University, information systems and software are designed to be user friendly.	3.71	1.75	12.6	17.9	14.8	18.1	17.9	14.3	4.4
T3 *	It is difficult for me to use information systems without extra training.	4.27	1.80	5.2	15.4	17.4	16.0	14.3	18.7	12.9
T4	Technology that supports collaboration is rapidly placed in the hands of employees	3.55	1.46	10.3	16.2	14.2	39.6	10.0	7.2	2.5
T5	Technology links all members of the organisation together and to relevant external institutions	3.99	1.65	7.2	16.9	10.8	24.9	21.8	11.9	6.6
T6	Whenever a new technology involving communication is introduced, training is quickly provided	4.09	1.64	9.1	11.4	10.5	24.4	24.7	14.7	T6

*(*denotes negatively worded questions)*

In spite of the investments that universities have made in this area in recent years, answers to the assertion that their organisation does not foster the development of "human-centred" information technology were largely neutral and the most significant category of responses was "neither agree or disagree" which was 44.4% (T1). Further ambivalence to universities" approach to technology was demonstrated in question T4. Nearly 40% neither agreed nor disagreed that technology that supports collaboration is rapidly placed in the hands of employees.

Responses were the negative side of neutral in T2. Only 4.4% strongly agreed that information systems and software are designed to be user friendly. In question T5, responses were yet again neutral concerning the statement that "technology links all members of the organisation together and to relevant external institutions". The most sizable category was again "neither agree nor disagree" at just under 25%.

There were more positive feelings about the quick introduction of training referred to in question T6. A total of 44.7% demonstrated some level of agreement, although those that neither agreed nor disagreed still formed a significant proportion of 24.4%.

An even spread of responses was displayed in answer to the statement that "It is difficult for me to use information systems without extra training" (T3). All categories were between 12.9% and 18.7% apart from "strongly disagree" at 5.2%.

6.6.8 Motivation to Comply

Table 6.14: Motivation to Comply

		Mean	SD	1	2	3	4	5	6	7
M1	Generally speaking, I try to follow the Vice Chancellor's policy and intention	4.33	1.63	7.5	8.8	6.1	33.4	17.4	18.2	8.6
M2 *	Generally speaking, I have my own views and do not accept and carry out my manager's decision	4.83	1.59	3.6	4.7	9.4	26.4	15.4	24.0	16.5
M3	Generally speaking, I respect and put into practice my colleagues decisions	5.39	1.19	1.4	1.9	2.7	11.8	28.6	39.6	14.0

*(*denotes negatively worded questions)*

Respondents broadly agreed that they try to follow the Vice Chancellor's policy (question M1) with 44.2 in agreeing with the statement to some extent. Although a very significant percentage of 33.4% were in the 'neither agree nor disagree' category.

Similarly, 55.9% of respondents disagreed with the assertion that they have their own views and do not carry out managers decisions (M2). As with the previous question a very significant proportion of 26.4% neither agreed no disagreed thus indicating some doubt among many respondents.

Respondents were more certain about being able to put their colleague's decision into practice. This is indicated by a mean of 5.36 and a standard deviation of 1.19. Nearly 70% of respondents slightly agreed or agreed with the statement and a further 14% strongly agreed.

6.7 Summary

The findings in this chapter indicated first of all that academics have positive attitudes towards knowledge sharing and that research and teaching knowledge is shared more often than social knowledge or knowledge

regarding procedures and processes. They have a strong expectation of rewards, such as promotions, and associations with colleagues in return for their knowledge sharing. They were also aware of a cultural norm that encouraged them to share. However, responses from the components of organisational culture demonstrated broadly neutral responses. Thus, despite the presence of a cultural norm, the effect of organisational culture on sharing seems somewhat less than that of individual beliefs in the probability of rewards and associations and value of contributions. The next chapter will involve analysing quantitative data to ensure that measurement of variables is valid and reliable. Structural equation modelling will be used to develop a

Chapter 7

Factor Analysis and Model Development

The questionnaire data presented as descriptive statistics in the preceding chapter will be subjected to factor analysis in this chapter using SPSS in order to ascertain a pattern of variables. The results of structural equation modelling and validity and reliability issues will then be discussed for each group of questions. Once model fit issues have been resolved a research model will be developed.

Introduction

The first stage of model development was to perform Exploratory Factor Analysis (EFA) using SPSS. This entailed a process of data reduction by the Principal Component Method (employing eigenvalues) with the purpose of investigating the interrelationships and underlying structures within the data. Thus all items group onto various factors and this enabled questionnaire items that load onto an incorrect factor to be identified and removed (Pallant, 2011).

Once the structure was developed and more specified using EFA, Confirmatory Factor Analysis (CFA) was then utilised in order to develop and test the measurement model which comprised of questionnaire items and latent variables. This is the first stage of the two stage Structural Equation

Modelling process as recommended by Byrne (2001). Unlike EFA, CFA enabled factor loadings to be amended in search of a better model fit. This process is described in detail for each latent variable and their questionnaire items in the CFA section.

Once a good measurement model fit was established as defined by established threshold parameters, a structural model was constructed in order to test the relationships mapped in the research model. Model fit was again rigorously tested before the results of the hypotheses testing were generated.

7.1 Exploratory Factor Analysis

Exploratory factor analysis, according to Hatcher (1994), is appropriate when identification of the nature and quantity of underlying variables is needed, in other words to ascertain whether questionnaire items were measuring what they were intended to (Stapleton, 1997). It has also been depicted as a procedure to generate rather than test theory (Stevens, 1996).

There are two types of EFA (Exploratory Factor Analysis) to choose from that perform a similar function. Both Factor analysis and Principle Component Analysis can condense a number of variables and shrink a substantial quantity of questionnaire items into a lesser number of scales Hatcher (1994). Stevens (1996) expressed a preference for Principle Component analysis due to its less complicated mathematical approach. Principle components are in fact 'perfect representations of extracted components', whereas in factor analysis the factor scores are estimates (Hatcher, 1994: 70).'

Principle Component Analysis has therefore been used for the purposes of this theses and the analysis was carried out on 63 items that used a Likert 7 point scale. Tabachnick and Fidell (2007) suggested that over 300 cases for

analysis was preferable for generalisation purposes and this study contains data from 317 respondents. Costello and Osborne (2005) recommended that an exploratory methodology should be used, thus items that are low loading or load into more than one factor should be considered for exclusion.

A crucial initial decision is to decide how many factors to retain and Kaiser's criterion, where factors with an eigenvalue of above 1.0 are retained, is one way of achieving this aim. This is however considered by many researchers to lack accuracy (Velicer and Jackson, 1990). Thus many researchers choose the scree plot method (Costello and Osborne, 2005). In this process a scree plot of the eigenvalues is generated and all the factors below the break in the plot should be retained.

The 67 items of the scale were subjected to Principal Components Analysis (PCA) using SPSS version 19. Prior to performing PCA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin value was .885 exceeding the recommended value of .6 (Kaiser, 1974), and Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance, supporting the factorability of the correlation matrix.

Principal Component analysis revealed the presence of 17 components with eigenvalues exceeding 1, which are shown in the table below along with their respective variances.

Table 7.1: Initial Eigenvalues; Percentages of Variance

Component	***% of Variance***
1	21.804
2	6.939
3	4.576
4	3.713
5	2.934
6	2.667
7	2.527
8	2.376
9	2.213
10	2.121
11	1.998
12	1.899
13	1.765
14	1.712
15	1.633
16	1.575
17	1.505
1	21.804

An inspection of the scree plot (shown below in Figure 2) revealed a clear break after the fifth component. Using Catell's Scree Test (1966) it was decided to retain five components for further investigation. The five component solution explained a total of 40% of the variance.

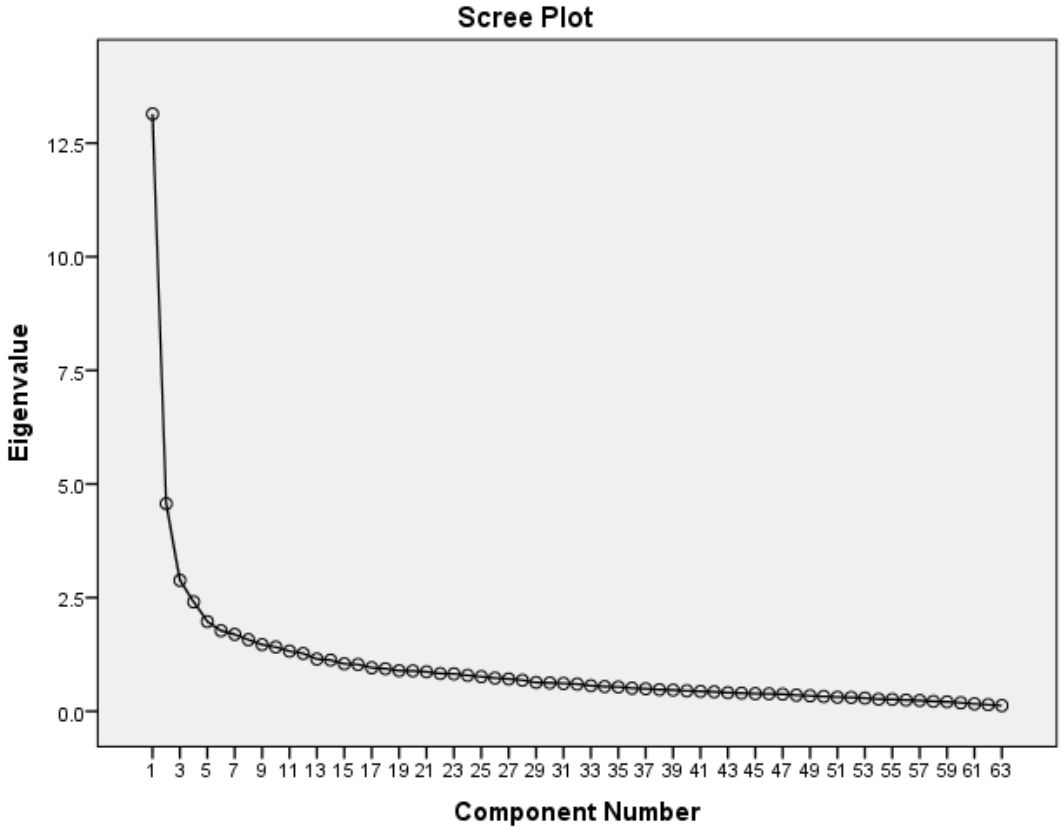

Figure 7.1: Scree Plot

A further important choice concerns the use of rotation methods during the analysis. Both methods are intended to present the data in a way that aids interpretation (Field, 2009). Orthological rotation is purported to produce results that are simpler to interpret but important information could be lost if the factors show correlation (Costello and Osborne, 2005, consequently oblique rotation is used for this research. Direct Oblimin is the mode of oblique rotation used, however according to Fabrigar et al. (1999) each method in any case produces broadly similar results. The pattern matrix generated is inspected for strength of loadings and for items that do not appear to be measuring the factors they were intended to measure. Commonalities, Pattern Matrix and Structure Matrices for five factor analysis can be found in Appendices 2, 3 and 4 respectively. In keeping with the exploratory approach and as suggested by Costello and Osborne (2005) Principle Component Analysis was run with different numbers of factors thus

generating different pattern matrices. The purpose of this was to compare loadings onto different components. Strong loadings were consistently grouped onto some components; however some questionnaire items appeared to be measuring a different variable than intended and were removed from the dataset. Further analysis of the pattern matrix analysis revealed that the innovativeness questionnaire items were loading onto different components than intended and as a result were removed from the dataset. Similar analysis led to the Rewards and Associations section on the questionnaire being split into two separate sections for analysis purposes in Confirmatory Factor Analysis. The questions that were removed are shown in Table 7.2 below.

Table 7.2: Questions removed after Principal Component Analysis

Item	***Factor***
My department discourages suggestions for new opportunities	Innovativeness
My department puts much value on taking risks even when there is a potential for failure	Innovativeness
My department accords a high priority to sharing and learning the best practices from others	Innovativeness
My department discourages finding new and different methods to complete tasks	Innovativeness
Members of my department feel a strong loyalty to their institution	Affiliation to institution
Employees are discouraged to ask others for assistance when needed	Values
My knowledge sharing activities would not improve my sense of self worth	Associations
My knowledge sharing would not result in colleagues sharing their knowledge with me	Associations
Members of my department have a clear view of the direction of the institution	Leadership
My knowledge sharing would reduce the productivity in the organisation	Contribution

Before the data can be used in Confirmatory Factor Analysis it is necessary to ensure no missing values are present. Schreiber et al. (2006) did not recommend listwise and pairwise deletion unless the missing data were demonstrated to be missing at random, and instead suggest the Expectation Maximisation or Maximum Likelihood algorithm. The Expectation Maximisation method (also known as single imputation), as in all methods of providing estimates for missing data does not provide real data, however it reduces bias and includes data that could have remained unused (Scheffer, 2002) and has been used for the data in this analysis.

7.2 Structural Equation Modelling

7.2.1 Confirmatory Factor analysis

The EFA process enabled removal of unsound measurement items given an accurate indication of how the variables load onto the factors. Consequently, the next stage in the quantitative research process was to perform Confirmatory Factor Analysis in order to generate a causal model from the findings of the questionnaire survey and test hypotheses. Byrne (2001) pointed out the suitability of SEM (Structural Equation Modelling) for Confirmatory Factor Analysis and this is the process that will be used to test the relationships in the model. According to Byrne (2001; p 3) SEM is '... a statistical methodology that takes a confirmatory (i.e. hypothesis testing) approach to the analysis of a structural theory based on some phenomenon'. One significant benefit of SEM (Structural Equation Modelling) is that is offers powerful methods of determining reliability and validity and also ensuring structural relationships are accurate (Babin and Svensson, 2012).

Babin and Svensson (2012) also pointed out the growing popularity of SEM particularly in social science research. This has been fuelled by the introduction of more user friendly software packages such as Amos that offers a graphical interface so that relationships between factors can be

clearly depicted. Amos version 19 was utilised for the purposes of this research.

This research takes a two stage approach to Structural Equation Modelling (Hair et al. 1995). The measurement model is initially developed using the SPSS data used in EFA and shows '... the pattern of observed variables for those latent constructs in the hypothesised model.' CFA is then used to find out how reliable the observed variables are (Schreiber et al. 2006). Interrelationships between latent factors are also assessed. Segars and Grover (1998) suggested that the measurement model should be tested and if necessary amended in order to produce the best fit. Factor loadings (the strength of relationship between the indicator variables and latent factors) should be a least 0.70 according to Fornell and Larcker (1981) and this is a major factor in deciding which indicator variables to retain for the final model. Factor loadings in excess of 0.5 can also sometimes be considered (Johnson and Stevens, 2001). Since in learning environments a standardized factor loading of 0.5 and above is considered acceptable (Johnson, and Stevens, 2001), a cut-off value of 0.6 and above is considered in this study.

The purpose of the measurement model is to demonstrate that the indicator variables (in this case questionnaire items) are accurately measuring the latent variables they are supposed to be assessing. Thus the strength of the relationship between the indicator and latent variables needs to be assessed. A minimum of two indicator variables for each latent factor has been recommended by Nunnally (1978), but at least three is preferable (Hatcher, 1994). The recommended minimum amount of observations (or completed questionnaires) is 150.

The structural model depicts the relationships between the latent variables and how they can affect other latent variables thus enables the testing of hypothesised relationships (Byrne, 2001). These can be first order (directly

measured by the indicator variables) or second order, where first order latent factors are related to a single second order factor (Byrne, 2001).

7.2.2 Model Fit Indices

The question of which model fit indices to use has been a subject of considerable debate. Kline (2005) suggested that articles can stress different fit indices and the opinions of article reviewers can also affect this process. The lack of consistency was pointed out by Hooper *et al.* (2008) in their synthesis of current thinking on model fit indices. Some previously accepted fit indices are purported to have drawbacks. Chi-squared was usually utilised (often referred to as x^2) but this can be adversely affected by small and large sample sizes.

A variety of measures have since been suggested. The normed fit (NFI) and the non-normed fit index (NNFI) were suggested by Bentler and Bonnet (1980), and the goodness of fit (GFI) and adjusted goodness of fit (AGFI) were proposed by Jöreskog and Sörbom (1986)

Further indices were proposed by Tucker and Lewis (1973), Bollen (1989) and Bentler (1990) which were the TLI index (often known as the Non-normed Fit Index (NNFI), the Incremental Fit Index (IFI) and Comparative Fit Index (CFI) respectively. Bollen (1989) also suggested the Root Mean Square Residual (RMR) Index and the Root Mean Square Error of approximation (RMSEA) was originated by Steiger and Lind (1980) and attempts to allow for the error of approximation in the population. The latter has '...only been recently recognised as one of the most informative criteria in covariance structure modelling' (Byrne, 2001:84).

The above measures are purported to assess the accuracy to which the model fits the data observed. An exact fit is indicated by a measurement of 1.0, with the exception of RMR where an ideal fit is indicated by a measurement of zero (Hulland, Yiu and Lam, 1996).

In terms of acceptable thresholds for NFI, IFI and CFI, an adequate fit is indicated by a value of at least 0.90 (Hair *et al.* 2006), although above 0.95 suggests a good fit (Hulland, Yiu and Lam, 1996). GFI and AGFI should also be achieving .95 or over to indicate a good fit (Byrne, 2001). With regard to RMSEA, a value of below .05 demonstrates a good fit although values of between 0.08 and 0.10 can show a mediocre fit (Byrne, 2001). Finally, a chi-square value of less than 5 indicates a good fit (Bentler and Bonnett, 1980).

A few researchers believe that only chi-square (x^2) should be used such as Barrett (2007). However, many researchers believe others should be included due to sample size issues with this measurement Cagli (1984). Hulland, Yiu and Lam (1996) suggested that due to possible discrepancies associated with the chi-square measure, a selection (but not all) of the above goodness of fit measures should be utilised. Bentler (1990) indicated that the IFI, NNFI and CFI should be the preferred methods of model fit analyses, but that CFI should be the pre-eminent index in this group and . However, Fan *et al. (*1999) also recommended the CFI and NNFI as well as the RMSEA and consequently this study will utilise x^2 and RMSEA for model fit and IFI, TLI and CFI for model comparison. The inclusion of a parsimony goodness of fit index is also recommended by Byrne (2001). The PGFI was originated by James, Mulaik and Brett (1982) to assimilate model complexity. The threshold for this index is less well-defined that the other indices, however closer to 1.0 indicates a better model fit (Schreiber *et al.* 2006) although it could be as low as 0.5 (James, Mulaik and Brett, 1982). Kline (2005) believes that, despite reported problems, chi-square should also always be reported, and this too will be part of the model fit analysis in this thesis. The recommended p-value is greater than 0.05 (Hair *et al.* 2006). However, Chibnall (2000) suggested that the p-value test can be inconclusive and far less powerful when a low CMIN/DF is present. Also, p-values below 0.05 are far more likely when there is a high sample size.

Jackson, Gillaspy and Purc-Stephenson (2009, p 17) conducted a study of reporting practices for CFA between 1998 and 2006 and affirmed that most studies '... reported multiple fit measures from different families, namely absolute and incremental.' Consequently this investigation will present the results in the same way, thus individual sections will deal with different latent variables. Three asterisks indicates that correlations are significant. Table 7.3 below depicts the recommended thresholds as discussed above along with the initial and actual final model fit statistics. Section 7.2.4 explains the adjustments which were necessary to the measurement items in order to achieve a good model fit.

Table 7.3: Measurement Model Fit

Index	***Model Fit Thresholds***		***Source***
	Moderate	Good	
CMIN/DF (x^2)	≤5	≤5	Hair *et al.* (2006)
RMSEA	≤.10	≤.05	Byrne, 2001
IFI	≥.80	≥.90	Hu and Bentler (1999)
NNFI	≥.90	≥.95	Hair *et al.* (1998)
AGFI	≥.80	≥.90	Hair *et al.* (1998)
CFI	≥.80	≥.90	Hu and Bentler (1999)
p-value	>.05	>.05	Hair *et al.* (2006)
PGFI			Byrne(2001)

7.2.3 Validity and Reliability

Validity and Reliability are established by investigating the following factors:

- Face Validity
- Discriminant Validity
- Convergent Validity
- Reliability

Face Validity is established by the researchers own experience and sense of whether the constructs and variables are what would be expected. As the researcher was an insider that enabled some degree of insight into what would be expected for the university context. In addition, the researcher discussed expectations with members of the supervisory team.

Convergent and discriminate Validity are linked with the multi-method approach adapted by Campbell and Fiske (1959). Convergent validity measures '... the extent to which the scale correlates positively with other measures of the same construct' .Discriminant validity is '...the extent to which a measure does not correlate with other constructs with which it is supposed to differ' (Malhotra, 2002, p 294). There are now no convergent or discriminant validity issues and the process by which these have been resolved is discussed in the Measurement Issues section below. Appendix 5 shows the corresponding factor correlation matrix.

Reliability is measured by composite reliability (CR) and these are now all above the recommended threshold of .70 apart from Motivation which is marginally below at .686.

The recommended thresholds are as follows:

Convergent Validity

- CR > AVE
- AVE > 0.5

Factor loadings (standardised regression weights) 0.7

Discriminant Validity

- MSV < AVE
- ASV < AVE

Reliability

- CR > 0.7

(Hair et al. 2010; Fornell and Larcker, 1981).

Key to Abbreviations

Composite Reliability (CR),

Average Variance Extracted (AVE)

Maximum Shared Squared Variance (MSV)

Validity and reliability

7.2.4 Measurement Issues

The following section investigates the reliability and validity scores for each of the items in the constructs to determine if any items should be excluded.

Table 7.4 Autonomy

Item Code	***Question***	***Initial Standardised Loadings***	***Final Standardised Regression Weights***
Au1	Each person can decide his/her own way of working to accomplish tasks	.536	
Au2	* People do not have the freedom to plan their tasks	.894	.916
Au3	* People do not have the freedom to make major decisions regarding their tasks	.801	.803
Au4	Each person can set his/her own targets	.43	

In this section the negatively worded questions (as noted by the asterisk) produced the highest loadings and this denoted that these items were strongly related to the latent variable 'Autonomy'. It should be noted that these items have been reverse coded in the supporting SPSS database as recommended by Pallant (2010).

Although three indicator variables would have been preferable the loadings on AU1 and Au4 were considerably below the recommended 0.7 threshold, and these items were therefore discarded

Table 7.5: Affiliation to Discipline

Item Code	***Question***	***Initial Standardised Loadings***	***Final Standardised Loadings***
AD1	The views of other academics are important to me	.66	
AD2	* I have very little contact with other academics of the same discipline	.574	
AD3	Members of my department feel a strong loyalty to their academic discipline	.469	
AD4	* Academics in my discipline consider that building and maintaining academic networks is not a high priority	.383	

Affiliation to discipline did not figure in the questionnaire on which this survey was based, however because of the contextual difference between higher education and commerce it this dimension was included and the questions were based on relevant literature. However none of the variables met the recommended threshold of 0.7, although AD1 approached that figure.

Furthermore this latent variable and its indicators were affected by a number of validity issues. In terms of convergent validity the AVE for Affiliation to Discipline was less than 0.50. Discriminant validity was also an issue; the square root of the AVE for Affiliation to Discipline was less than one the absolute value of the correlations with another factor and the AVE for Affiliation to Discipline was less than the MSV. In view of these difficulties this latent variable was discarded for the final analysis therefore to final loadings appear in the table. Removal of this item also improved model fit.

Table 7.6: Affiliation to Institution

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
AI1	Members of my department keep close ties with one another	.72	.71
AI2	* Members of my department often fail to consider other members' standpoint	.66	.68
AI3	Members of my department have strong feeling of 'one team'	.80	.75
AI4	* Members of my department do not co-operate well with each other	.81	.86
AI5	Members of my department feel a strong loyalty to their institution		

Affiliation to Institution again did not figure in the questionnaire on which this survey was based, however because of the contextual difference between higher education and commerce and the distinct dimensions of discipline and institution referred to in the literature it this dimension was also included.

Item AI5 was removed as a result of CFA. Examination of the Pattern Matrix produced in SPSS showed that the question measured more than one factor. There were no issues of convergent or discriminant validity and loadings were in excess of 0.7 and in the case of item AI2 only just below.

Table 7.7: Leadership

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
L1	Members of my department have a clear view of the direction of the institution		
L2	* The opinions of members of my department are not sought and valued by the Senior Management Team	.657	

Table 7.7 (continued)

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
L3	The Senior Management Team holds a position of respect amongst members of my department	.789	.780
L4	* Objectives are given to me which are often unreasonable	.644	.624
L5	I can trust my manager's judgement to be sound	.706	.711
L6	* My manager shows favouritism towards specific persons	.577	

Item L1 was removed at the EFA stage because it was measuring the 'values' latent variable more strongly than leadership. Question L6 was not used in the final model because the loading was too low. The leadership latent variable aloes suffered from convergent and discriminant validity problems. The AVE was less than the recommended threshold of .50 and also less than the MSV. The removal of item L2 corrected that issue but item L4 was retained in order to ensure that the preferred number of three measurement items was attained (Hatcher, 1994).

Table 7.8: Values

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
V1	The university has a clearly articulated set of values	.846	.843
V2	The values of the university are well known and generally accepted by its members	.936	.939
V3	Employees are valued for their individual expertise	.664	.663
V4	Employees are discouraged to ask others for assistance when needed		
V5	Employees are encouraged to discuss their work with people in other workgroups		

Question V5 was removed at the EFA stage because it was not measuring value effectively and was grouped with Leadership items on the pattern matrix. Item V4 was also deleted during EFA because it appeared to be measuring rewards and associations rather than values.

Factor loadings were good on V1 and V2 and V3 was retained again because of the benefit of using three rather than two measurement items and also because it was only just below the recommended threshold. There were no validity and reliability problems with this variable.

Table 7.9: Contribution

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
C1	* My knowledge sharing would not help others in the organisation to solve problems	.508	
C2	My knowledge sharing would create new business opportunities for the organisation	.639	.652
C3	My knowledge sharing would improve work processes in the organisation	.724	.710
C4	* My knowledge sharing would reduce the productivity in the organisation		
C5	My knowledge sharing would help the organisation to achieve its performance objectives	.785	.797

Question C4 was deleted during EFA because it was grouped with Rewards and Associations on the pattern matrix and consequently was not measuring Contribution. C1 was removed due to its low standardised regression loading. Deletion of this item also solved a convergent validity issue where the AVE for contribution was originally less than .50.

Table 7.10: Technology

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
T1	* My organisation does not foster the development of 'human-centred' information technology	.490	
T2	Technology links all members of the organisation together and to relevant external institutions	.657	.675
T3	It is difficult for me to use information systems without extra training.	-.235	
T4	Whenever a new technology involving communication is introduced, training is quickly provided	.608	
T5	In this University, information systems and software are designed to be user friendly.	.700	.684
T6	Technology that supports collaboration is rapidly placed in the hands of employees	.748	.757

Examination of the loading showed that items T1, T3 and T4 were below the acceptable level to indicate that they were measuring the technology latent variable, consequently these were deleted. The first version also exhibited discriminate and convergent validity issues. I terms of discriminate validity the square root of the AVE was less than the MSV and with regard to convergent validity the AVE for Tech was less than 0.50. The first issue was solved by the removal of the three measurement items; however the AVE is still less than .50 in the final model. This is not however considered to be a problem because the actual figure is barely below the threshold at .498.

Table 7.11: Structure

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
S1	The structure of this department promotes collective rather than individualistic behaviour	.398	
S2	The university designs processes to facilitate knowledge exchange across departmental boundaries	.694	.755
S3	The university encourages people to go where they need for knowledge regardless of structure	.772	.825
S4	The structure of this department inhibits interaction and knowledge sharing	.543	

S1 and S4 were deleted from the final model on the basis of their low regression weights. In addition S4 measured Affiliation to institution better than Structure according to the pattern matrix during EFA. Two discriminant validity issues were also discernible in the initial model. The AVE for structure was less than the MSV and the square root of the AVE for structure was less than the one the absolute value of the correlations with another factor. Convergent validity was also compromised because the AVE for structure was less than .50. The removal of the two measurement items solves all these problems and regression weights for the remaining two items were enhanced.

Table 7.12: Intention

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
I1	* I have no intention of sharing my knowledge with more departmental members	.361	
I2	I intend always to provide my knowledge at the request of organisational members	.611	.591

Table 7.12 (continued)

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
I3	*I intend to share my knowledge with other organisational members less frequently in the future	.477	
I4	I intend to share my knowledge with any colleague if it is helpful to the organisation	.649	.862

Factor loadings were not as good as had been observed with some other latent variables. I1 and I3 were immediately removed on the basis of their low loadings. I2 was retained on the basis of Johnson and Stevens (2001) assertion that a loading of .50 is acceptable in learning environments and also to ensure that the recommended minimum of two measurement items was attained (Nunnally, 1978). The AVE for intention was originally a discriminant validity problem at less than .50 but this was solved by the removal of the I1 and I3.

Table 7.13: Attitude

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
A1	* I do not enjoy sharing my knowledge	.451	
A2	Sharing my knowledge with other organisational members is a valuable experience	.839	.805
A3	Sharing my knowledge with other organisational members is a wise move	.774	.817
A4	I share my knowledge in an appropriate and effective way	.607	.610

Examination of the loadings suggested that A1 should be removed because of low factor loading. A2 and A3 had high factor loadings; however A4 was retained in order to reach the preferred number of measurement items.

Initially the convergent validity was less than 0.50, but this issue was resolved by the removal of A1.

Table 7.14: Norms

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
N1	* My Head of Department does not think that I should share my knowledge with other members in the organisation	.631	.707
N2	My manager thinks that I should share my knowledge with other members in the organisation	.911	.818
N3	My colleagues think I should share knowledge with other members of the organisation	.673	.775

Factor loadings were above an acceptable level both in the initial model and final model. The loadings were enhanced in the final model following the removal of items relating to other latent variables.

Table 7.15: Motivation

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
M1	Generally speaking I try to follow the Vice Chancellor's policy and intention	.688	.768
M2	Generally speaking I have my own views and do not accept and carry out my manager's decision	.703	.675
M3	Generally I respect and put into practice my colleagues decisions	.533	

All the questionnaire items on motivation were used in CFA. The loading for item M3 was not sufficient; consequently it was deleted from the final model. There were two validity and reliability issues for this variable. The CR for motivation was less than .70 and the AVE for motivation less than .50.

Deletion of item M3 solved the second issue but the CR for the final model was still less than .70. However this was a marginal difference (CR = .686) therefore the other two measurement items were retained.

Table 7.15: Rewards

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
R1	* I am less likely to be considered for interesting and prestigious projects if I engage in knowledge sharing	.444	
R2	I am more likely to be considered for internal promotions if I engage in knowledge sharing	.776	.796
R3	I am more likely to be considered for appointments in other universities if I engage in knowledge sharing	.725	.752
R4	* I am less likely to be given the opportunity to attend conferences and other events if I share my knowledge	.344	

The 'Rewards' latent variable is the second half of the original 'Rewards and Associations' variable. However the loadings in the initial model were not as strong as in the associations section. R1 and R4 had quite low loadings and were removed from the model. Only two measurement items remained but both have strong loadings. In the original model convergent validity was less than .50 however this issue was resolved by the removal of items R1 and R4.

Table 7.16: Associations

Item Code	***Question***	***Initial Standardised Regression Weights***	***Final Standardised Regression Weights***
As1	My knowledge sharing would strengthen the ties between existing members and myself in the organisation	.790	.788
As2	My knowledge sharing would get me well-acquainted with new members in the organisation	.875	.876
As3	My knowledge sharing would enable me to associate more with other members in the organisation	.844	.847
As4	* My knowledge sharing would not result in colleagues sharing their knowledge with me.		
As5	My knowledge sharing would create strong bonds with members who have common interests in the organisation	.703	.700
As6	* My knowledge sharing activities would not improve my sense of self worth		

Associations were grouped with rewards in order to measure the latent variable 'Rewards and Associations in the original questionnaire. However, it became clear in EFA that they were two distinct clusters. Accordingly they were separated into two latent variables for the purposes of CFA. In addition, on examination of the pattern matrix in EFA As4 appeared to be measuring two factors, and As6 three factors. Consequently both were removed from the model. The remaining four items had more than acceptable loadings and thus were retained for the final model. There were no Validity or Reliability issues.

7.3 Final Measurement Model

In the table below the model fit thresholds are shown alongside those of the initial and final measurement model. A good model fit was achieved once the necessary adjustments had been made to the constructs in the previous section.

Table 7.17: Final Measurement Model Fit

Index	***Model Fit Thresholds***		***Source***	***Initial Model***	***Actual Model***
	Moderate	Good			
CMIN/DF (x^2)	≤5	≤5	Hair *et al.* (2006)	1.957	1.907
RMSEA	≤.10	≤.05	Byrne, 2001	.051	.050
IFI	≥.80	≥.90	Hu and Bentler (1999)	.837	.921
NNFI	≥.90	≥.95	Hair *et al.* (1998)	.817	.901
AGFI	≥.80	≥.90	Hair *et al.* (1998)	.808	.836
CFI	≥.80	≥.90	Hu and Bentler (1999)	.834	.919
p-value	>.05	>.05	Hair *et al.* (2006)	.000	.000
PGFI			Byrne(2001)	.689	.675

7.4 Structural Model

The measurement model clearly demonstrated a good fit judging by a variety of indices as shown in Table 7.17. Consequently, according to the two stage approach to model development (Hair et al. 1995), a structural model (shown in Figure 7.2) was proposed that followed the research model approach by grouping organisational culture and individual beliefs separately as second order variables. Organisational Culture was supported by Leadership, Structure, Affiliation to Institution, Values, Autonomy and Technology. These are depicted as first order variables and have been tested for validity earlier in the chapter. Beliefs were similarly supported by Rewards, Associations and Contributions. According to the Theory of Reasoned Action, behaviour can be influenced by the subjective norm and this consists of norms and motivation in the model. Standardised coefficients shown on the model indicate the strengths of the relationship between variables.

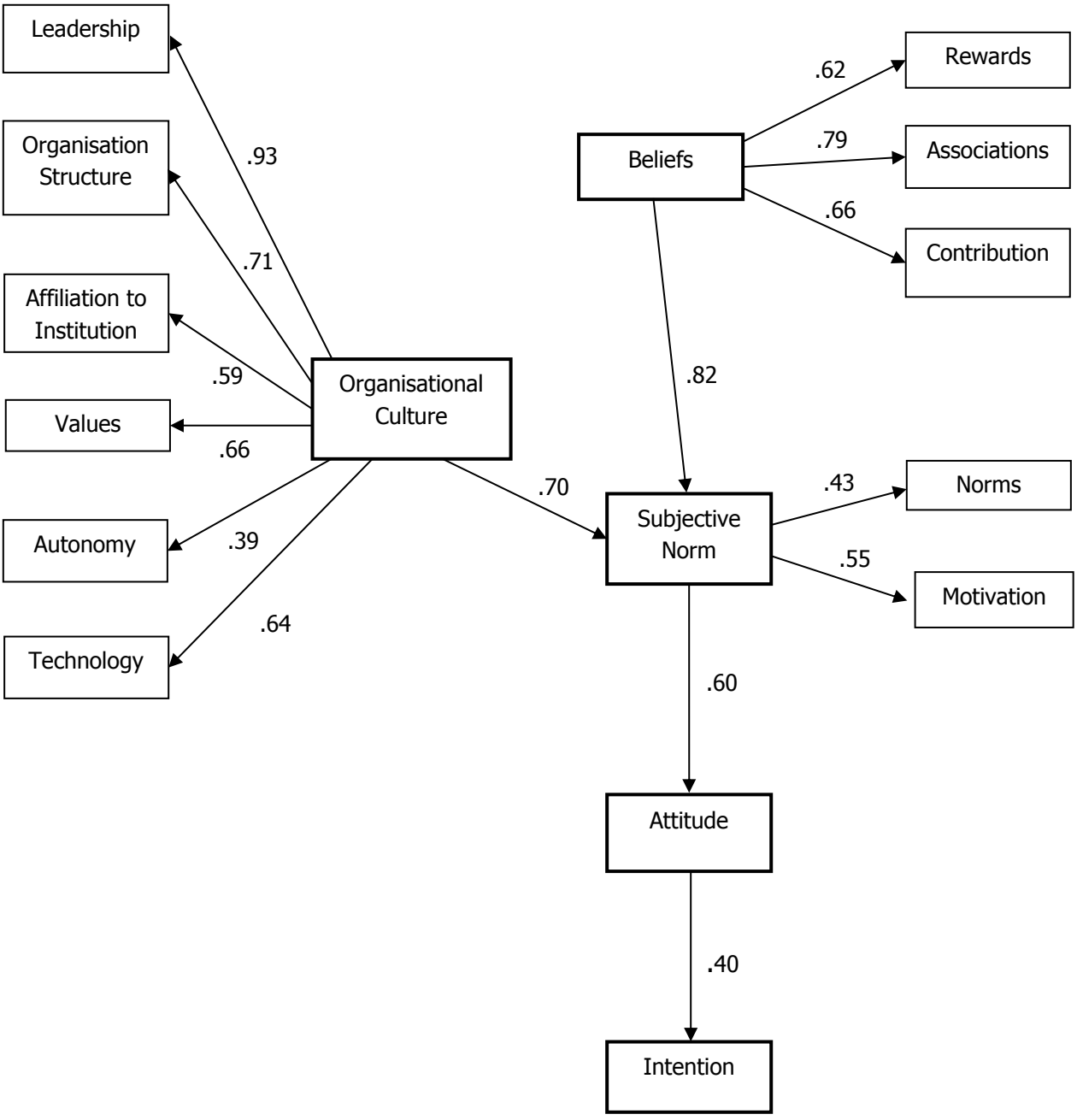

Figure 7.2: Final Structural Model

Hypotheses results, which will include implications of standardised coefficients, will be examined in the discussion chapter, however from a brief examination of the above model, it can be deduced that beliefs have a much stronger relationship to attitude to sharing than organisational culture and attitude does not have a particularly strong effect on intention to share. All component variables of organisational culture have a reasonably strong relationship with organisational culture with the exception of autonomy. The effect of leadership is however particularly notable. Beliefs are generally well supported and associations had the strongest relationship with beliefs.

It can be seen from Table 7.18 below that a reasonably good model fit has been achieved although not as good as the measurement model.

Table 7.18: Model Fit Thresholds

Index	***Model Fit***			***Final Measurement Model***	***Final Structural Model***
	Moderate	Good			
CMIN/DF (x^2)	≤5	≤5	Hair *et al.* (2006)	1.907	2.291
RMSEA	≤.10	≤.05	Byrne (2001)	.050	.060
IFI	≥.80	≥.90	Hu and Bentler (1999)	.921	.872
NNFI (TLI)	≥.90	≥.95	Hair *et al.* (1998)	.901	.860
AGFI	≥.80	≥.90	Hair *et al.* (1998)	.836	.803
CFI	≥.80	≥.90	Hu and Bentler (1999)	.919	.871
p-value	>.05		Hair *et al.* (2006)	.000	.000
PCFI			Byrne, (2001)	.752	.721

However, Hatcher (1994) pointed out that a model does not have to meet all the criteria in order to be accepted and if too many modifications are attempted there is danger that alterations will be driven by the data instead of the researcher's theory. This may lead to the finding becoming less generalisable because a heavily modified model will fit only data from a particular sample. Consequently, it has been decided that the actual structural model will not be subject to any further modifications.

Hypothesised relationships within the model are presented in Table 7.19 below are assessed for statistical significance by considering the critical ratio (CR) which is calculated by dividing the estimate by the standard error. A value in excess +1.96 (or lower than -1.96) demonstrates two sided significance at 5% (Hox and Bechger, 1998). P-value should also be ≤ .05 (Byrne, 2001). Standardised loadings (which indicate the strength of relationships between factors) '…. can be interpreted in the same way as in exploratory factor analysis' (Hox and Bechger, 1998).

1 Table 7.19: Hypothesised Relationships in the Structural Model

Hypotheses	Paths	Standardised Coefficients	Estimate	SE	CR	P	Results
H1- The stronger the propensity towards knowledge sharing in the organisational culture, the stronger the propensity to sharing knowledge in the subjective norm	Subjective Norm <--- Org Culture	.70	.324	.065	5.008	***	Supported
H2- The more supportive leadership is towards knowledge sharing, the stronger the propensity towards knowledge sharing in the organisational culture	Leadership ---> Org Culture	.93	1.426	.195	7.319	***	Supported
H3- The more supportive organisational structure is towards knowledge sharing, the stronger the propensity towards knowledge sharing in the organisational culture	Structure ---> Org Culture	.71	1.282	.170	7.552	***	Supported
H4- The greater affiliation to institution in support of knowledge sharing, the stronger the propensity towards knowledge sharing in the organisational culture	Affiliation ---> Org Culture	.59	1.142	.166	6.871	***	Supported
H5- The more supportive values are towards knowledge sharing, the stronger the propensity towards knowledge sharing in the organisational culture	Values ---> Org Culture	.66	1.365	.178	7.653	***	Supported
H6- The greater the autonomy in support of knowledge sharing, the stronger the propensity towards knowledge sharing in the organisational culture.	Autonomy ---> Org Culture	.39	.793	.159	4.987	***	Supported

2

1 Table 7.19 (continued)

Hypotheses	Paths	Standardised Coefficients	Estimate	SE	CR	P	Results
H7- The more supportive technology is towards knowledge sharing, the stronger the propensity towards knowledge sharing in the organisational culture	Technology ---> Org Culture	.64	.876	.127	6.871	***	Supported
H8- The stronger the expectation of rewards, the stronger the propensity towards belief in the value of knowledge sharing	Rewards ---> Beliefs	.62	1.199	.185	6.475	***	Supported
H9- The stronger the expectation of associations, the stronger the propensity towards belief in the value of knowledge sharing	Associations ---> Beliefs	.79	1.330	.180	7.381	***	Supported
H10- The stronger the desire to contribute, the stronger the propensity towards belief in the value of knowledge sharing	Contribution --->Beliefs	.66	.752	.102	7.381	***	Supported
H11- The stronger the beliefs in the possibility of rewards for knowledge sharing, the stronger the propensity to sharing knowledge in the subjective norm	Subjective Norm <--- Beliefs	.82	.482	.095	5.092	***	Supported
H12- The stronger the propensity to sharing knowledge in the subjective norm, the more favourable the attitude towards knowledge sharing	Attitude <--- Subjective Norm	.60	1.705	.311	5.475	***	Supported
H13- The stronger the attitude to knowledge sharing, the stronger the intention to share knowledge	Intention <--- Attitude	.40	.394	.095	4.127	***	Supported

7.5 Summary

In this chapter, exploratory factor analysis by use of the principal component method has resulted in the removal of some questions from the analysis. Confirmatory factor analysis by use of structural equation modelling has helped to resolve measurement, validity and reliability issues and enabled the development of an initial structural model. A final structural model was developed that included the subjective norm in order to comply with TRA theory which suggested that subjective norm affects intentions. Model fit was within recognised parameters in both cases. The next chapter will examine qualitative data and hypothesised relationships shown above in Table 7.19 will be discussed in chapter 8 along with findings from the qualitative data.

Chapter 8

Qualitative Data

This chapter initially locates the qualitative data collection within the mixed methods approach and explains the choice of questionnaire design. It then gives a breakdown of interviewee demographics and moves on to discuss concepts of coding and analysis of themes. Later on in the chapter, themes are developed from the interview questions and interviewee's responses are detailed. These will be discussed along with the quantitative findings in the final discussion chapter.

8.1 Mixed Methods Approach

As discussed in Chapter 5, a sequential mixed methods approach has been used where collection of qualitative data followed a few weeks after quantitative. Cresswell (2009) suggested that in this approach the fact that the quantitative research is emphasised first gives it more weight within the overall project and this has certainly been the case in this thesis. Similarly, in this thesis the initial quantitative survey is more substantive than the qualitative survey, which is essentially intended to follow up in more detail themes from the quantitative data and to elicit suggestions from interviewees ways to improve knowledge sharing.

Cresswell (2009) also pointed out that decisions need to be made regarding when to mix the two sets of data. This could be at the end of the process or

at a stage somewhere in between the beginning and end. In this case the two sets of data are merged at the end of the process in the final discussion and conclusions chapter as suggested in the exploratory sequential design. Consequently, in this chapter as in previous chapters there will be no discussion of the actual findings.

8.2 Demographics and Analysis of Themes

8.2.1 Demographics of Interviewees

The table below lists the, interviewee codes and gives a brief description of the person's position, gender and also their discipline. The codes in the first column are used to identify citations taken from interview transcripts. Some interviews were conducted by means of videoconferencing using Skype (Skype interviews have been marked with an asterisk). Nine of the interviewees previously completed the questionnaire survey. However overall there were insufficient volunteers and three more interviewees were identified using a purposive method with the object of obtaining as representative sample as possible in the circumstances.

Table 8.1: Demographics of Interviewees

Code	***Discipline***	***Post or Pre 92***	***Position***	***Gender***
Int1*	Social Sciences	Post 92	Professor	Female
Int2*	Science, Technology and Engineering	Pre 92	Associate Professor	Male
Int3	Social Science	Post 92	Principal Lecturer	Female
Int4*	Humanities	Pre 92	Professor	Female
Int5	Social Sciences	Post 92	Senior Lecturer	Female
Int6*	Science, Technology and Engineering	Post 92	Senior Lecturer	Male
Int7	Social Sciences	Post 92	Associate Lecturer	Male
Int8	Social Sciences	Post 92	Senior Lecturer	Female

Int9	Social Sciences	Pre 92	Senior Lecturer	Male
Int10*	Social Sciences	Post 92	Senior Lecturer	Female
Int11	Humanities	Pre 92	Professor	Male
Int12	Science, Technology and Engineering	Pre 92	Senior Lecturer	Male

In the following discussion quotations from interviewees have been referenced to this table and disciplines have been abbreviated as follows:

SS- Social Sciences

ST- Science and Technology

H- Humanities

Gender and type of institution is also indicated.

8.2.2 Thematic analysis and Coding

In order to break the data from the semi-structured interviews into meaningful patterns, thematic analysis was used (Miles and Huberman, 1994). This involved collating and examining data from each transcript and searching for notable themes and in particular issues that are mentioned by multiple interviewees. The importance of thematic analysis is stressed by Ryan and Russell Bernard (2003:86)

> Without thematic categories, investigators have nothing to describe, nothing to compare, and nothing to explain. If researchers fail to identify important categories during the exploratory phase of their research, what is to be said of later descriptive and confirmatory phases?

According to Ryan and Russell Bernard (2003), themes can originate from the data in an inductive way, however often they flow from which topics the researcher has chosen to cover (Dey, 1993), and this is certainly the case with this research where themes were initially delineated by the topics discussed in the questions. However, some themes such as culture and structure spread beyond the boundaries of an answer to a particular question and factors such as liking appeared when exploring other themes.

Transcription of the interviews is said by Ryan and Russell Bernard (2003) to be the beginning of the procedure to identify themes. This was very much the case in this investigation where all the interviews were transcribed by the researchers, thus the process of familiarisation with the data could begin immediately. When identifying themes, researchers tend to search for the following according to Ryan and Russell Bernard (2003)

- Incidents of repetition
- Metaphors and Analogies
- Transitions (which can be indicated by a change in tone of voice or pause)
- Similarities and differences
- Linguistic connectors
- Missing data
- Theory related material

In this research incidents of repetition have played a major part in capturing themes. Some metaphors and analogies have been in evidence and often significant opinions have been denoted by a pause or change in tone to demonstrate gravity. In addition, some topics that might be expected to be discussed, such as the individualist nature of academics are largely absent.

Researchers then often produce a list of codes with which to identify themes. Some codes are defined immediately and some others are added after

further exploration of the data, thus it can be considered an iterative process (Miles and Huberman, 1994). According to Boyatzis (1998) the process of coding involves identifying a moment of significance and coding it in advance of final data interpretation. The coding frame can be found in Appendix 6.

Analysis of themes is referred to by King (1998) as 'template analysis', and he considered that a critical benefit of this approach is that it necessitates a structured approach. However a degree of flexibility is still maintained. This could assist in producing a lucid, well organised narrative of the research (King, 1998).

8.3 Analysis of Themes

The purpose of the interviews was to expand upon and develop the relationships found in the data in more depth, gain insight on how academics perceived knowledge sharing and to gain suggestions for improving the process.

8.3.1 Knowledge sharing factors

Interviewees were asked to identify the most important enablers to knowledge sharing. Some focussed on organisational factors such as culture and leadership but there was very little mention of structure except in the sense of physical structure of buildings. Others focussed on the importance of trust and politics. The majority mentioned culture, with Int9 (SS Pre 92 M) particularly stressing its critical importance.
'Culture is by a street the most important'.

Int10 (SS Post 92 F) and Int3 (SS Post 92 F) thought that their culture was open and collaborative. Int3 (SS Post 92 F) did however contrast the culture on the two sites within the same university and also cited the importance of a staff common room or similar to a sharing culture.

'When I was working there then nobody missed break times in the morning or lunchtimes in the common room it was heaving and we all sat around in multi subject groups'.

Int11 (SS Pre 92 M) felt that the physical structure of the building failed to provide a communal meeting place and that corridor conversations were the norm.

'Physical structure of the building-yes there's no real place to talk, only the corridors which is pity'.

Int5 (SS Post 92) F thought that culture could be imported if a significant number of staff had worked in professional practice prior to entering higher education. A combination of structure, culture and social relations was pinpointed by Int6 (ST Post 92 M) as the most important determinant of knowledge sharing. In contrast to most other respondents, Int 1 (SS Post 92 F) felt that the prevailing departmental culture was to concentrate knowledge at the apex of the hierarchy and that sharing knowledge was actively discouraged.

The physical structure of office accommodation was also highlighted by other interviewees. Int3 (SS Post 92 F) felt that two person offices were facilitated knowledge sharing. Int5 (SS Post 92 F) expressed the same sentiments but pointed out that relocation should be used as an opportunity to ensure that staff working together is compatible.

'I think some considerable thought went into matching people together who might well be sharing information.'

The benefits of academics being located together were particularly stressed by Int5 (SS Post 92 F, Int6 (ST Post 92 M) and Int9 (SS Pre 92 M).

'The impact of the change the physical change to sharing one (building) is enormous.'

Int9 (SS Pre 92 M) also highlighted the benefits a move to open plan offices can bring but doubted whether this format could work in academia. The symbolic importance of leaving office doors open was stressed by Int3 (SS Post 92 F).

'When I first moved into this building here people just went into their rooms and shut the doors and you never knew whether they were in or out and I campaigned gradually to change that because if I'm in the room the door is always open and with the exception of one that's what everyone does on our floor.'

However Int3 (SS Post 92 F) believed in the importance of personal space and did not like the hot-desking approach encountered in another sector of academia.

Trust was the most important individual factor for many respondents. Int10 (SS Post 92 F) suggested was the most important knowledge sharing factor. Int 1 (SS Post 92 F) pointed out that

'...I'm more likely to share sensitive knowledge with people that I trust so trust really matters.'

This aspect was echoed by Int6 (ST Post 92 M), Int11 (SS Pre 92 M) and Int12 (H Pre 92 M) who affirmed that there was complete trust in the department between colleagues.

'All my colleagues I would trust. I would give them anything. There wouldn't be any hesitation on my part about giving them any of my information at all.' (Int6 ST Post 92 M)

Int5 (SS Post 92 F) linked trust to the likelihood of reciprocation in knowledge sharing activities.

'I think that's something I try and gauge quite early on- it's an awful phrase but what's in it for me- is there going to be some benefit?'

Similarity of research interests and a general interest in another person's activities and whether a possibility of foreign travel existed were also stressed by Int5 (SS Post 92 F). However, Int11 (SS Pre 92 M) was alone in suggesting that relevance was the main issue when sharing information.

Int2 (ST Pre 92 M) and Int8 (SS Post 92 F) both experienced issues of trust in a more negative way. Lecture material from Int8 (SS Post 92 F) was used by a colleague without knowledge and intellectual property concerns were felt by Int8 (SS Post 92 F) to be the most important consideration when deciding whether to share knowledge. However, Int12 (H Pre 92 M) emphasised that there were no intellectual property issues and it would not occur to anyone not to share.

'...it belongs to the university, but there is still a concern that people have invested time and effort into doing that and therefore they are often reluctant to pass material on to other people for that reason.'

Int2 (ST Pre 92), along with Int4 (H Pre 92 F) also felt that politics was a significant issue in academic departments although this feeling was not replicated by the majority of respondents.

'Public and private agendas are often quite different.'

The characteristics of academic were highlighted by Int4 (H Pre 92 F) who perceived a strong individualist character within the profession.

'...an individualistic world', and thought that academics were *'...quite self-centred, concerned about their literature, their reputation, the fact that they are doing their job well and being very famous.'*

These characteristics were in turn linked to their power and the consequent difficulties for junior staff. However, most interviewees did not make reference to this aspect.

Rewards for sharing were mentioned by Int5 (SS Post 92 F) who felt that evidence of research collaboration was one of the main criteria for obtaining a promotion and that in itself involves knowledge sharing.

Lack of time was mentioned by most interviewees. Int9 (SS Pre 92 M) drew attention to the difference between workload at pre and post 92 universities where the workload at post 92 universities is perceived to be greater therefore and therefore create more of a time constraint. This interviewee also highlighted a personal workload increase.

'I think time is hugely important. In my seven years here, technically, my workload has not changed one iota. In practical terms I think it's probably doubled.'

Int4 (H Pre 92 F) was concerned about the constraining effect of the Research Excellence Framework.

'...again I feel we don't have enough time to communicate, to share knowledge and the pressure we are under in our jobs now is making that task more difficult and the ref is putting extreme pressure on that system and people are not communicating properly...'

Int 1 (SS Post 92 F) highlighted the time intensive nature of tacit knowledge sharing and the necessity to be motivated to share.

'...It actually consists of a of one hour appointments with colleagues who are just starting their publishing strategy during which I pass on quite a lot of tacit knowledge and that kind of tailored individual transfer is time consuming and you've got to want to do it.'

Int11 (SS Pre 92 M) again felt that the time factor constrained the desire to share knowledge.

'We share very easily what bothers us most is having the time to share knowledge; we have very good trust in the department.'

Int6 (ST Post 92 M) linked the act of liking someone to sharing knowledge with them:

'... and we get on very well with them generally but... and there are some fantastic people there who I like enormously. But there are also some people who are just impossible and I can see it (knowledge sharing) happening there where there are just some people who are impossible to work with...'

In summary culture was the most important organisational factor to respondents and trust was the most critical individual factor. Clearly trust can also be an organisational factor and some respondents linked an atmosphere of trust with a collaborative and open culture. Structure and leadership were mentioned but not stressed. However the physical structure of the office accommodation and whether or not there was a physical separation of staff groupings was considered by many to be very significant. Time was mentioned by some interviewees as a constraint to knowledge sharing but only one respondent made reference to the individualist character of academics and the concentration of departmental power and knowledge.

Some factors were expanded upon in questions specifically about Leadership, Structure, Culture and Technology. Interviewees were also

asked about their suggestions for encouraging knowledge sharing and their opinions on why knowledge sharing may be resisted.

8.3.2 Culture

Many of interviewees characterised their culture as collaborative, open and favourable to sharing.

'Yes that's my feeling (open and sharing). As far as I can see there's no point in not sharing your knowledge unless you think someone's actually going to take it off you, and where I'm working there's so much to do that I don't see any problems about people potentially sharing it or anything (Int6, ST Post 92 M).

Two interviewees (Int 1, SS Post 92and Int5, SS Post 92 F) believe that there is a strong link between a knowledge sharing culture and locating the staff in close physical proximity to each other, although one interviewee believes being located in different sites at different times of the week helped to obtain valuable knowledge.

One interviewee (Int1, SS Post 92 F) thought that departmental cultures are quite different in the same building and thought characteristics of people teaching in a particular discipline was the explanation.

'...this goes back again to different disciplines behaving differently, we've got a whole bunch of cheerful sociable ... types and more retiring ... types.'

On a similar theme, Int8 (SS Post 92 F) thought that there was a different culture in each academic group within their particular school, and considered their own culture to be oriented towards flexibility.

'Very much a culture of things are done and will get done but they are not necessarily done in a very structured way'.

Similarly, the effect of one or two person offices is highlighted by two interviewees (Int3 SS Post 92 F and Int5 SS Post 92 F) who both think it can be of enormous benefit to sharing knowledge but one is convinced that great deal of planning is required.

' *I think some considerable thought went into matching people together who might well be sharing information'* (Int5 SS Post 92 F).

This interviewee also pointed out that combination degrees can help break down cultural barriers between disciplines that can inhibit sharing. The most negative comment regarding the influence of culture came from Int2 (ST Pre 92).

'I think people just live in their little world most of the time'.

One interviewee felt that resentment of a culture imposed from above was what united departmental members.

'I think one of the things is there has definitely been a common enemy—maybe enemy is too strong a word—in fighting the culture that come down from the top and we've all had to suffer all the changes together so and much the best way then is to pull people together and you know we support each other then—we all need support –supporting each other I think that been a very important part of the point of it and I haven't thought of it in that way but perhaps that's helped us.' (Int6, ST Post 92 M)

8.3.3 Leadership

Most interviewees did not perceive leadership as the most critical of knowledge sharing factors. However they clearly understood different approaches to leadership and provided an insight on the type of leadership style employed in their department.

The majority of the interviewees perceived their leader to possess integrity and to command integrity and trust. In the case of Int6 (ST Post 92 M)the leader was viewed with affection as a trusted friend and also respected.

'I think he's very good at his job, I'm very fond of him and I think... well I can only speak personally here but he' very widely respected. He always does his job to the best of his ability and he's not always going to please me that's for sure but I feel very happy with him.'

Interviewees mostly found their leader to be empowering and in two cases laissez faire.

'... if you get on with your job he'll just leave you' (Int5, SS Post 92 F).

One interviewee felt the laissez faire approach was making their leader unpopular with senior managers (Int10, SS Post 92 F) and similarly one felt that their leader acted as a buffer against the ideas of higher management.

'... he's well aware of the silliness that happens at the top managerial level. He has to deal with them.'

Another thought that the laissez faire approach was characterised by a general lack of interest by the leader in staff and this led to failure by this academic to volunteer specialist knowledge.

One academic felt that their work was recognised by their leader, whilst acknowledging the resource constraints of the sector.

'...he just said I've got the money, put a plan and a budget together'.

However this interviewee also felt that those with the most helpful disposition were generally asked to do the most (Int5, SS Post 92 F).

Only one interviewee described their leader as transactional in style and described how a more performance management oriented approach was pervading the department

'We were all given a workload allocation... but it was done without negotiation' (Int8, SS Post 92 F*).*

However one consequence of imposed workloads was mutual exchange of knowledge in order to gain expertise in unfamiliar subjects. In one case decision making was felt to be secretive.

'...decisions come out from behind closed doors and we jump' (Int3, SS Post 92 F)

…and one interviewee described the leader as *'...invisible and absent'* (Int9, SS Pre 92 M).

Int12 H Pre 92 M thought their leader had a contingency approach but more often gave requests rather than orders.

A single interviewee (Int2, ST Pre 92, Int9, SS Pre 92 M) commented on the lack of a clear management structure in terms of decision making levels and the inability of managers to enforce a decision or address unacceptable standards

'... there is reluctance bordering on the unprofessional to be honestly critical of others and there is no disciplinary process worth the name'.

Interviewees in general thought that they were expected to share knowledge, but there were few explicit signals by the leader to demonstrate

this apart from emails to circulate departmental issues and advice on what to discuss at meetings. However, Int4 (H Pre 92 F) experienced a reaction of surprise when attempting to circulating knowledge after first joining the department.

'...they said we are amazed you've done that. Why did you do that?'

In summary interviewees thought their leaders were worthy of respect and understood the constraints of the job. Only one interviewee described a transactional form of leadership style while other described their leader as laissez-faire and empowering.

8.3.4 Structure

Many interviewees seemed quite uncertain with regard to the structural type employed in their departments and did not relate structure strongly to knowledge sharing. The most common description of structures given in the interviews was a matrix. However a significant number of interviewees were critical of this structural type.

'...when the ... School went to matrix management, it was awful because you don't know what's happening and no-one has responsibility' (Int1, SS Post 92 F).

A lack of transparency about managerial positions and decision making authority within the department also characterised some feelings about the matrix.

'The Director of the School has 70 direct reports because all the structure below him has no authority. It is insane...' (Int9, SS Pre 92 M)

Int7 (SS Post 92 M) expressed similar sentiments:

'...but I think the structure of it comes back to the point about there often being a lack of clarity about who is being designated in leadership positions and whether they're comfortable in that role'.

This situation did however lead to an attitude to knowledge sharing that was more relaxed in character according to Int7 (SS Post 92 M).

The situation regarding decision making authority was highlighted by Int9 (SS Pre 92 M).

'That people can just say no is disgraceful and it's a wonder that anything ever gets done'.

An intended matrix structure had become top heavy and bureaucratic according to Int3 (SS Post 92 F).

'It's supposed to be a matrix but you've got that triangle or pyramid'.

Int4 (H Pre 92 F) focussed more on the knowledge sharing aspect of the matrix but felt that it was inappropriate to use the same matrix for differing subject groups.

Most interviewees commented on the issue of subject groups but had widely differing opinions:

'...we see those subject groups as way of reclaiming control of our subjects' (Int1, SS Post 92 F).

Int4 (H Pre 92 F) was unsure about the benefits of subject groups.

'In our department who are research active and we are now discussing how to build on that and how to make sure we can learn from each other and how we can build on that eventually whether you are launching a review or journal you know being much more proactive ... In my previous institution it

was viewed quite negatively because some groups were put in a position of power'.

Int5 (SS Post 92 F) felt the demarcation between subject groups was being broken down by combination degree teaching which led to more sharing of knowledge. However Int6 (ST Post 92) M thought there was a strong rationale for working mainly within subject groups

'...but they are the people we have most in common with and teach with so I suppose that's what you would expect. Within that we tend to know what each other is doing roughly'.

8.3.5 Technology

There was no criticism of the functionality of Virtual Learning Environments (VLE's) used by the interviewees which were either Moodle or Blackboard. Similarly, improvements to the software were not suggested.

Many interviewees focussed on the underuse of these systems.

'It seems such a shame that Moodle is used as a repository, bung a set of lecture notes on it, well that's not what an online learning environment is supposed to be like.' (Int3, SS Post 92 F).

'*Moodle, VLE and what have you, I think it has a lot of potential for sharing knowledge but it probably comes back to the culture of the place and it doesn't seem to be used particularly for that end*.' (Int7, SS Post 92 M)

Int4 (H Pre 92 F) and Int5 (SS Post 92 F) did however use their VLE's for discussion forums and felt that they were beginning to make greater use of the systems' potential.

Int 1 (SS Post 92 F) was the only interviewee to mention social media. In contrast Int2 (ST Pre 92 M) suggested that '...You don't use it as a

communication mechanism you just do your own thing.' Int6 (ST Post 92 M) suggested that a reduction in technology would encourage more face to face contact.

Int11 (SS Pre 92 M) felt that virtual connections between colleagues and others were excellent but linked the expansion of virtual communication with a growing lack of personal contact

'What we do less, and we used to do more is talk because you have all these things so you have colleagues that for all sorts of reasons write to you when they are next door and could sort it out. I'm not sure every single time but sometimes it's quicker to have a quick conversation and finish it off than start going back and forth via email, so if anything had to improve it would be back to basics, back to looking at someone in the eyes and talking to them.'

8.3.6 Suggestions for encouraging knowledge sharing

A majority of the suggestions were concerned with face-to-face contact.

'Face-to-face is essential, it has to be one to one and also so group session' (Int4, H Pre 92 F).

'It's not just about sharing, it's about co-construction of knowledge which as professionals we ought to be engaging in and great deal more than be probably have the time to do, and it feels that that always happens best face to face' (Int3, SS Post 92 F).

Int 1 SS Post 92noted that a research writing group helped to facilitate the sharing of research knowledge. Similarly, Int5 (SS Post 92 F) thought the writing group was benefiting less experience staff

'... so maybe again giving to newer researchers an opportunity to get involved and get their foot on the ladder.'

Int 1 (SS Post 92 F)one also considered that a monthly teaching group would be beneficial

'...where you share your information and what's worked for them'.

However this interviewee warned that time would be a problem for universities that did not have a broad research base.

Int10 (SS Post 92 F) thought that groups and newsletters that cover research interests across the university would be beneficial.

'Someone wrote a paper at my university about my area and I didn't know about it'.

Int4 (H Pre 92 F) pointed out that knowledge sharing activities need time to work.

'There were a lot of discussions because we tried to convince the Head of Department that they needed to give assume kind of workload relief.'

Int2 (ST Pre 92 M) also highlighted a particular time constraint concerning research activities.

'Reduce the pressure on academic staff because everything is focussed towards the REF. Everything is performance related, so you're always being directed into writing applications and papers and that's fine but if you're not given that time to actually sit down and do that talking with people then you don't have time to do it'.

Time spent liaising with other departments in order to co-ordinate research activities was a key problem to be addressed according to Int11 (SS Pre 92 M), who also felt that a preoccupation by management with workload measurement was a critical factor:

'I don't know how they do it but...I think people like the fact they can quantify and see the numbers but I think that creates lots of injustices at the same time... so again the issue is to let us do our job.'

Int11 (SS Pre 92 M) thought a solution to this problem would be re-allocate some work currently done by academics that could be done by others.

'You don't have to have PhD... If all these things were done by reasonably intelligent people ...we would have a lot more time to do these things.'

Others felt that management commitment to sharing activities was essential. An example was provided by Int5 (SS Post 92 F).

'He's (Head of Department) asked a Principal Lecturer here who has a track record in publishing to actually organise that (Research Writing Group) so again there is very much support from above who would like to see this happening'.

Int5 (SS Post 92 F) felt that a departmental newsletter would also be useful for knowledge exchange.

'...one of the things that's going to be going into that is information about people who've been accepted for conferences, little reports back on conferences people have been to and whether they would recommend it for next year so again just letting people know what other people are doing'.

The importance of reporting back to other departmental members on conference experiences was highlighted by Int3 (SS Post 92 F).

'...so you think about that before you go and you come and you come back and that's really fantastic and I'm dying for my colleagues to know this but really all you can do is put it in an email, try to convey some of your enthusiasm but it's nowhere near as powerful as somebody with you saying

this is really great, you need to know about this...there's no substitute for that happening face to face'.

Some felt that it is highly beneficial to locate colleagues from the same department in the same building on the same floor (Int1 SS Post 92 F, Int5 SS Post 92 F and Int9 SS Pre 92 M).

'One observation I've made is the importance of physical geography in knowledge sharing so now that my department has moved ... the amount of information and knowledge exchange has increased dramatically simply by running into people yeah. I run into people quite often and have a cup of tea' (Int1 SS Post92 F).

The situational and cultural aspect of knowledge sharing was also emphasised by Int7 (SS Post 92 M):

'I think if that was managed more effectively so that people were brought more together in a more constructive way instead of people working in little tightly bounded environments I think there would be more knowledge sharing because I think the underlying culture of the place actually facilitates that, what stops it is that people actually aren't together. It's simply opportunity, yes'.

Others suggested that providing opportunities in the shape of communal areas was critical.

'We've also got the opportunity- the goldfish bowl office- so if you want more of us to have a look at that, we can go in there' (Int5, SS Post 92 F).

For Int8 (SS Post 92 F) and Int6 (ST Post 92 M), team teaching was an important way of sharing knowledge.

'It's the way we teach together. There's constant section meetings and departmental meetings where we try and thrash out what we need to do for the undergrads and then going on from that the number of associates that we have...in any one section its very small and there is an atmosphere of openness' (Int6, ST Post 92 M).

Int4 (H Pre 92 F) focussed on a recent role as knowledge sharing champion and initiating group processes

'... each department had champion... It was quite easy for me to facilitate graduate research and with what was going on and every often colleagues don't speak to each other and because we always had this challenging situation of having different disciplines in the same department I took quite a lot of time to sit with valued colleagues to say what are you doing in your research? Is it likely to develop? How can we help you a faculty level?'

The role of HR systems was also emphasised by Int4 (H Pre 92 F) to encourage engagement in knowledge sharing.

'I think it was good because the committee for promotion was looking at how people engage with the process. If you are doing that it will be recognised and you will have some point if you want to have a salary increase'.

However no other interviewees linked promotion to knowledge sharing in such a specific way.

Awaydays was another suggestion. Int2 (ST Pre 92 M) thought these had originally been valuable.

'We go away for a whole day, lunch is provided we brainstorm stuff that affects us all. First time it happened it wasn't too bad. Then it's actually been pared back so the awayday actually happens on campus after lunch'.

In general suggestion focussed on sharing of research rather than teaching information, although this was not completely neglected. Face to face sharing was repeatedly emphasised and the importance of having time to share and commitment from management support was also considered highly significant.

8.3.7 Rewards for Sharing

Interviewees did not in general identify any monetary rewards that could flow from their knowledge sharing activities. Int 1 (SS Post 92 F) felt that frequent sharers were the most admired in their profession and tended to be cited more by others. Int 1 (SS Post 92 F) and Int8 (SS Post 92 F) both enjoyed the pleasure helping other staff and watching them develop. Int9 (SS Pre 92 M) was similarly motivated to help colleagues.

'I am a very strong believer in helping people when I can and I believe I'm generous with my time when it comes to that sort of thing. I do not believe there are any extrinsic rewards directly related.'

8.3.8 Barriers to sharing

There was greater concentration on the individual character of academics when interviewees were asked why knowledge sharing may be resisted.

'...it goes against the grain of what academia is about, at the end of the day academics are making their credibility and their reputation on keeping knowledge for themselves and publishing knowledge so knowledge is the key to your own trajectory.' (Int4, H Pre 92 F)

Int6 (ST Post 92 M) expressed similar sentiments.

'I think big egos and feeling that you've found something, make sure you get it published you know...this is your thing and other people shouldn't be part of it.'

Int9 SS Pre 92 M felt that a lack of sharing demonstrated feelings of selfishness and insecurity. Similarly, Int 1 (SS Post 92 F) thought that academics who find it difficult to acquire knowledge are less likely to relinquish it.

'Because of the old adage that knowledge is power some people find it difficult to acquire knowledge—I could almost say the less academically competent you are the more you're going to hang on to the knowledge that you've strived to get.'

The issue of individual trust was highlighted by Int5 (SS Post 92) and Int8 (SS Post 92 F).

'...it may be a bad experience in the past where somebody feels they've been a bit ripped off in their knowledge sharing.' (Int5, SS Post 92 F).

Only Int7 (SS Post 92 M) mentioned that the prevailing culture would in any case prevent knowledge sharing.

'I've certainly seen that before and even though you can have a group of people working together who would in another context be more than happy to share knowledge but the culture works against it'.

Summary

The findings from the interview data suggested that academics were in general happy to share knowledge, in particular research knowledge with colleagues. They pointed out a broad selection of factors that could influence their sharing, but out of these, culture stood out as the most important. In addition the importance of location and structure of offices were particularly stressed as well as the need to have time to share.

The majority of interviewees did not consider departmental structure to be crucial but were highly critical of the matrix form of structure and unclear

levels of responsibility. Most interviewees thought that their leader was supportive, and were broadly happy with the collaborative technology provided by institutions. Some pointed out the underuse of collaborative technology but did not link this to knowledge sharing.

Trust was a critical individual factor for many and some linked this concept to social exchange and reciprocal benefits that could be in the form of social capital or something more tangible. Many felt that face-to-face meetings were a crucial enabler of knowledge sharing and that this could be particularly important when sharing research and conferencing experiences.

The next chapter considers both quantitative and qualitative research findings and links them to existing literature on knowledge sharing.

Chapter 9

Discussion

The aim of this thesis was to investigate the influence of knowledge sharing factors on academics. In this chapter the results of the hypotheses are synthesised, along with the findings from the qualitative research and the descriptive statistics. Types of knowledge shared by academics and factors influencing sharing are considered and discussed in the light of existing literature.

9.1 Types of knowledge shared by academics

Questionnaire responses confirmed that academics share different types of knowledge but interview data suggested that academics were generally positive towards sharing knowledge. Results from the questionnaires did however suggest that research and lecturing knowledge is shared considerably more frequently than knowledge about university processes and procedures, and social and work news. It could therefore be suggested that research and teaching knowledge is in the forefront of their thoughts when other questions were being answered. This distinction is more noticeable in the interview transcript data where research and teaching knowledge were often mentioned and other types of knowledge were rarely referred to.

9.2 Organisational Factors

9.2.1 Organisational Culture

The link between organisational culture and knowledge sharing has been well documented. The rationale for the enhanced importance of organisational culture was established by research by De Long and Fahey (2000) which discovered that new technology infrastructure for knowledge sharing needed to be accompanied by a fundamental change in organisational values and practices. Culture was found by Ruggles (1998) to be the largest single impediment to knowledge sharing in a survey of company executive's opinions conducted by Ernst and Young thus stressing the importance of attaining a favourable culture. Hislop (2009) also highlighted the critical role organisational culture now occupies in knowledge sharing, which now overshadows the intellectual property and technological concerns that dominated earlier knowledge management literature. In this research the link between organisational culture and propensity to share knowledge in the subjective norm was found to be statistically significant (H1) and a moderately strong relationship was demonstrated (0.70).

Some articles have concentrated on organisational culture as a concept and others on conceptualised constituent parts. In this study some components used by Bock (2005) have been combined with those drawn from literature about the academic world such as autonomy and affiliation to institution (Lee, 2007). Delong and Fahey (2000) conceptualised culture as presenting barriers for knowledge sharing and McDermott and O'Dell (2001:85) suggested that '…balancing the visible and invisible dimensions of culture; sharing knowledge and building on invisible core values', would help to overcome those barriers.

With regard to the context of higher education, Cronin (2000) suggested that a strong recognised culture such as 'the HP way' was absent. Indeed, De Long and Fahey (2000) had suggested that discovering the nature of

sub-cultures in any organisation is critical to implementing knowledge management initiatives and Lee (2007) concurred with this view. She believed that the academic department could be conceptualised as an organisational culture where institutional and disciplinary culture meet and their interaction can give that culture its particular character. Institutional culture had more bearing on prestige orientation, student centredness, dissatisfaction with collegiate culture, commitment to diversity, commitment to scholarship and scholarly recognition, job satisfaction, collegiality, and governance stress. In contrast, disciplinary culture had more influence on instrumental orientation and multicultural orientation (Lee, 2007).

In the research model organisational culture is conceptualised as a second order latent variable and has encompassed the following first order variables; autonomy, affiliation to institution, structure, technology, leadership and values and these will be discussed in the forthcoming sections. However in terms of overall culture, interviewees generally felt the culture was collaborative, open and favourable to sharing. Some interviewees suggested that physical proximity strongly linked to a knowledge sharing culture and this supports Hislop's suggestion that purposeful knowledge exchange is difficult to achieve by virtual communication methods (2009). Lee (2007) commented on the singularity of departmental cultures and indeed some interviewees remarked on the difference between departmental cultures in the same building. Only one interviewee felt that their culture displayed a lack of trust and as result acted as a barrier to sharing teaching materials in particular.

9.2.2 Leadership

The positive influence of supportive leadership on the propensity of academics to share knowledge (H2) was confirmed and a standardised path coefficient of 0.93 indicated that leadership had a stronger relationship with organisational culture than any of the other components of organisational culture.

Top management support for knowledge sharing was found to be crucial in influencing the level of sharing amongst other employees by Lee et al. (2006). Similarly, Connolly and Kelloway (2003) found a link between management support for sharing knowledge and impressions of a knowledge sharing culture amongst employees. They also discovered a positive connection between transformational leadership and knowledge sharing.

In academia, two distinct types of leadership style have been identified by Yielder and Codling (2004). Academic leadership emphasises knowledge, professional recognition and expertise, personal qualities and team acceptance whereas managerial leadership highlights hierarchical position, job responsibilities, control and authority. Academic style is attributed to collegial universities and managerial leadership to more corporate style universities. Spendlove (2007) suggested that academic leaders should be flexible, open, honest and sensitive to the views of others as well as having the ability to delegate and many interviewees felt that their leaders displayed some or all of these qualities. However questionnaire respondents were divided in their opinions when asked if senior managers were worthy of respect.

Yielder and Codling's (2004) academic style of leadership was much in evidence. Personal qualities such as integrity and respect were emphasised and interviewees understood, and in some cases sympathised, with the pressures exerted from senior managers. Most also thought that their leader was laissez-faire in style but did not refer to this style in a negative way. This is perhaps not surprising because Lumby (2012) thought that academics required their leader to maintain their autonomy and a laissez-faire style facilitates more autonomy and empowerment. Leaders themselves were also very much aware of their own lack of power and the need to lead by consent (Middlehurst, 1993). Two interviewees from post 92 universities did however refer to their leaders as transactional in style and were starting to impose

workloads without negotiation. This is certainly reflects the new managerialist approach that characterises newer universities (Deem, 2004).

Politis (2001) analysed the relationship of leadership styles to knowledge management by measuring knowledge acquisition attributes of each style, He concluded that a participative rather that autocratic style supports knowledge acquisition. In addition those leaders that showed a high concern for production rather than people were negatively associated with dimensions of knowledge. Leaders were not generally thought by interviewees to stimulate the flow of knowledge around the department except for circulars in the form of emails and this could perhaps be attributed to a laissez faire approach. Indeed two interviewees thought that their leader had little interest in acquiring their knowledge even though they were quite prepared to volunteer it.

In conclusion questionnaire respondents were more unsure with regard to the question of whether their leaders were worthy of respect than interviewees. However, three out of four of the remaining questions in the leadership section of the questionnaires referred to the "senior management team" whereas the interviewees made it clear that they were referring to the Head of Department as an individual and this may account for the apparent inconsistency in the findings.

9.2.3 Autonomy

Autonomy in support of knowledge sharing was found to increase the propensity towards knowledge sharing in the organisational culture (H2). However the strength of the relationship to the organisational culture variable indicated by the standardised path coefficient (.39) was the lowest in the group of components supporting organisational culture, thus indicating a weak relationship.

This is not surprising given that a high level of autonomy can indicate that staffs are operating without being influenced greatly by the overall culture. This is also demonstrated by the questionnaire evidence in the previous section where respondents were unsure if there was a feeling of 'one team' and the neutering effect of academic autonomy on leadership has been demonstrated in the previous section.

The tradition of academic autonomy itself has been well documented. Academics have long expected to be self-led and also expect their autonomy to be protected by their by their leader (Lumby, 2012; Bolden et al. 2012). Although still strong, particularly in pre-92 universities, this tradition has been curtailed by the new managerialism ideas introduced by the conservative government (Deem, 2004). Questionnaire respondents generally appreciated the high level of autonomy they had been afforded to plan their own workload but were less sure about their freedom with regard to major decisions. Autonomy was not explicitly mentioned by interviewees, although in the section on structure many complained about the inability of managers to enforce decisions on staff and the general lack of power amongst those in positions of responsibility (below the level of Head of Department). They believed that this resulted in inequalities in workload, although significantly they did not link the lack of management power to the level of autonomy they themselves possessed.

9.2.4 Organisational Structure

A supportive organisational structure was strongly linked with propensity towards knowledge sharing (H3), and the standardised path coefficient of 0.71 indicated quite a strong relationship between the two variables.

The move away from bureaucratic forms to more decentralised forms of structure is widely credited with engendering an organisational structure that is more supportive of knowledge sharing (Peters, 1992; Handy, 1995). Knights and Wilmott (2007) highlighted the hierarchy of authority, the

prevalence of rules and the impersonality of bureaucratic organisations that encouraged the top down flow of knowledge. In contrast post bureaucracies encouraged sharing on a lateral basis through networking and relationships built on trust (Applebaum et al. 2000; Tucker, 1999). Indeed many organisations since the 1990's have attempted to transform themselves into flatter decentralised organisations with fewer levels of management (Willem and Buelens).

Furthermore, a functional structure is a disincentive to sharing knowledge according to Lam (2006) due to the barriers between functions that can affect communication and coordination. However, as Tippins (2003) pointed out, universities have rigid departmental boundaries that still inhibit such sharing. In addition there are differing structural characteristics in pre-92 and post-92 universities. Pre-92 institutions consisting of the plate glass and Russell Group institutions were depicted as affording a great deal of autonomy to managers and academics in general. In contrast, Post-92 universities were depicted as much more bureaucratic, affording less autonomy to teaching and research staff and in general influenced by ideas of new public management (Deem, 2004; Taylor, 2006). This also involved greater centralisation and an emphasis on ensuring value for money for the public by strict monitoring of budgets. The divisional form has also been in existence in higher education for a considerable time. In these cases faculties or different sites could be considered as divisions. The results of new public management and academic deskilling have been a reduction in autonomy and deskilling for academics according to Deem (2004).

Questionnaire survey responses supported Tippins (2003) depiction of solid departmental boundaries. Indeed, many academics disagreed that their organisational structure promoted collaborative behaviour and had mixed feelings on whether interaction and knowledge sharing are inhibited. However, most interview respondents believed that the prevalent structure in their department was a matrix (where line management interlocked with

subject group responsibilities), which is considered to be the structure that is the most supportive of knowledge sharing (Cummings, 2004), and associated with flexibility, innovation and creativity (Hatch and Cunliffe, 2006).

Most interviewees focussed on the implications of the matrix structure for decision making authority and responsibility by those in managerial and leadership positions and the resulting inertia and lack of clarity and this does reflect the lack of collaboration and interaction highlighted in the questionnaire findings. An inability and reluctance to challenge poor performance was also mentioned and this certainly could be again linked to a lack of power amongst departmental managers and high academic autonomy (Jackson, 1999; Middlehurst, 1993). These concerns also mirrored some cited disadvantages of the matrix structure such as slow reaction time and overlapping boundaries of responsibility and authority (Larson and Gobeli, 1987; Hatch and Cunliffe, 2006). Some respondents did however feel that combination degrees helped to break down barriers within the department.

Some interviewees felt that their institutions were becoming more centralised and that this was reducing their department's autonomy as well as their own. Willem and Buelens (2005) considered that centralisation was a disincentive to knowledge sharing because of the control exerted by top managers who could restrict ownership of knowledge. One interviewee felt that was very much the case with their departmental senior managers. Many felt that their leader was attempting to shield their department from what they considered to be excessive centralisation, which according to Shattock (2013) stemmed from new public management approaches.

9.2.5 Affiliation to Institution

A link between affiliation to institution and propensity to knowledge sharing was established (H4). However the strength of the relationship indicated by

the standardised path coefficient (.59) was again relatively low compared with other components of organisational culture in the structural model.

Lee (2007) suggested that academia is different from many organisational contexts in that some staff possessed a high level of affiliation to their discipline and this can affect the degree of affiliation to the institution itself. Some findings of the questionnaire survey reflected this tension. Respondents were undecided on whether there was a feeling of 'one team' and were unsure if others considered their standpoints. However, it was generally felt that cooperation between staff was good. Affiliation to discipline was in fact measured on the original questionnaire but was later discarded due to research model fit difficulties. However, descriptive statistics showed that affiliation to discipline was significantly higher than affiliation to institution thus supporting the idea of the two factor academic culture visualised by Lee (2007). Indeed interviewees frequently referred to their affinity to their own subject groups and research collaborators.

9.2.6 Values

Values supporting knowledge sharing were also found to increase propensity to share knowledge (H5). However the strength of the relationship indicated by the standardised path coefficient (0.66) was moderately low compared with other components of organisational culture in the structural model.

Values are a component of culture as depicted in Schein's model (1985) and are on the second level alongside beliefs below artefacts and symbols and above basic assumptions. They are not obvious and lie just beneath the surface of the organisation's consciousness and can be fashioned by the life experiences of members of the organisation (Hatch and Cunliffe, 2006). De Long and Fahey (2000) provided an illustration of a value for a knowledge sharing culture. This could be *every interaction with customers is important* and a value such as this could lead to the creation of useful customer knowledge. Alavi et al. (2006) asserted that values affect the behaviour of

employees and this naturally affects cultural norms. For example different values may affect how an employee reacts to authority and status and the degree of interpersonal trust within the company. Questionnaire respondents indicated that academics were clear about the values of the university and thought they were valued for their individual expertise. Interviewees did not explicitly mention values although some common values emerged such as interpersonal trust with colleagues and the importance of helping inexperienced researchers which was stressed by many.

9.2.7 Technology

Supportive Technology was found to have a positive effect on sharing knowledge in the organisational culture (H7). However the strength of the relationship indicated by the standardised path coefficient was relatively low (0.63) compared with other components of organisational culture in the structural model.

This may be considered somewhat surprising given the access that academics have to virtual learning environments and groupware. Electronic databases have also enhanced the amount of knowledge that can be accessed and exchanged but this is mainly of a codified nature. Virtual communication has indeed become much easier and convenient, however, Hislop (2009) suggested email is mainly suitable for highly codified knowledge and Mayer, Davis and Schoolman (1995) believed that the development of trust through email communication alone is difficult. Face-to-face is considered the most information rich form of communication that allows for rich feedback to occur. Indeed many interviewees complained about the overuse of email particularly when the colleague is in close proximity and observed that a richer exchange of knowledge could be achieved by face-to-face contact. Excessive email usage could also be explained by a culture that demands a record of interactions (Hislop, 2009) or that employees who are used to working alone may prefer email (Connelly and Kelloway, 2003). However interviewees generally felt that knowledge

sharing could be achieved by more face-to-face meetings, although they did not blame technology for this problem. Indeed many interviewees were pleased with the functionality of virtual learning environments such as Moodle but complained that many use this as a lecture slide repository and neglect other features such as the ability to host forums. There was certainly no evidence of academics feeling that the use of network technology led to deskilling as suggested by Noble (1998). Pan and Scarbrough (1999) described the *infoculture* as the cultural and social component of the social technical system and two interviewees did in fact suggest that the culture of the organisation determined how virtual learning environments are used.

These feelings were in contrast to some results from questionnaire respondents who were generally ambivalent to their institution's approach to technology in terms of the development of human centred technology and appropriate training. Indeed, Jarvenpaa and Staples (2005) found that a lack of positive perceptions of information linked to computers could discourage employees from using collaborative systems. However, Noble (1998) believed greater use of network technology in higher education would facilitate deskilling and a reduction in autonomy for academics and result in education simply becoming a commodity.

9.2.8 Physical Structure of Buildings

Sole and Edmondson (2001) highlighted the influence that close physical and geographical proximity can have on sharing knowledge, particularly that which is relevant to their own expertise. Oliver and Kandadi (2006) also commented on the usefulness of shared spaces to promote sharing.

Indeed, two interviewees felt that corridors were the only place to exchange information and lamented the lack of shared space. On interviewee felt that two person offices could provide the answer but a considerable amount of thought was needed to decide on staff that could be located together. One interviewee mentioned open plan design as a possibility but others were

hostile to this idea. Interviewees in offices that featured shared spaces were very positive about the benefits of this idea.

9.3 Individual Factors

9.3.1 Beliefs

Personal beliefs are crucial in the knowledge sharing decision because sharers can make a calculation with regard to the possibility of rewards as well as possible costs. Indeed strength of belief in the possibility of rewards was found to positively affect propensity to share knowledge (H8). Personal beliefs were also a greater influence on knowledge sharing than organisational culture (0.82).

Bock et al. (2005) considered that these could consist of a belief in extrinsic rewards for sharing such as an increase in salary or a promotion as well as intrinsic rewards such as enhanced associations with other academics by for example attendance at conferences. A belief in the value of contributions to the organisations was also thought by Bock to be a component of an individual's belief structure. Belief structures can therefore profoundly affect the decision to share which can be based on a cost benefit analysis by the potential sharer. Social exchange theory and the concept of social capital have been prominent in discussions concerning reward because the knowledge and information gained from others trusted associates may be more valuable than any other form (Granovetter, 1985). Rewards were not cited by interviewees as a significant motivator but three interviewees suggested that their reward was the pleasure of helping the careers of younger colleagues.

9.3.2 Rewards, Associations and Contributions

Rewards, associations and contribution were all found to have statistically significant effect on propensity to share knowledge (H9, H10 and H11). Associations had the strongest effect on beliefs (0.79) whilst associations

and contributions had fairly strong relationships with beliefs with standardised path coefficient of 0.62 and 0.66 respectively.

Bock et al. (2005) and Bock and Kim (2002) viewed rewards and associations as separate predictors of attitudes and discovered a negative association between knowledge sharing and extrinsic rewards, yet a positive association with reciprocal relationships. A broadly similar picture was depicted by Lin (2007). Reciprocal benefits, self-efficacy, and pleasure in helping others were associated significantly with knowledge sharing but organisational rewards failed to significantly affect knowledge sharing intentions. Joseph and Jacob (2011) found that anticipated reciprocal relationships led to favourable attitudes towards knowledge sharing. However, Kim and Lee (2006) in their study of public and private Korean organisations discovered that an emphasis by the organisation on performance based pay systems positively affected sharing.

Studies which include the influence of reward in academia have been conducted in Malaysia. Cheng, Ho and Lau (2009) found that incentive systems and personal expectation, are positively associated with knowledge sharing and both monetary and non-monetary rewards encourage knowledge sharing. Zawawi et al. (2011) looked at 17 public universities and determined that the most important barrier in knowledge sharing was the lack of organisational rewards. Clearly though, national culture could be influential in these surveys because these studies were conducted in countries with a high orientation to a collective culture which typically emphasise the importance of personal contacts much more than in the comparatively individualist countries such as UK (Hofstede, 1991). This is recognised explicitly by Bock et al. (2005) as a research limitation. Similarly, the results from the questionnaire respondents suggested that extrinsic rewards such as recognition, promotion and attendance at conferences positively affected their knowledge sharing behaviour as did the possibility of extending their network and developing relationships. Respondents also

broadly agreed that sharing would improve organisational performance. In the UK Turner and Gosling (2012) suggested that reward systems in academia have strongly benefitted those who publish regularly and one interviewee thought sharing as a result of a research collaboration could lead to a promotion.

Blau (1964) pointed out that knowledge could be thought of as a valuable resource to be exchanged and a calculation of benefits and costs is made before a decision on whether or not to share knowledge is made. If benefits exceed costs the knowledge sharing behaviour will continue. However, questionnaire respondents broadly felt that their knowledge sharing was likely to be reciprocated and did not envisage any negative consequences from sharing such as losing their individual competitive advantage (Bordia et al. 2006). In contrast, interviewees did not identify rewards as an important factor with regard to knowledge sharing and did not generally relate to monetary or other extrinsic rewards that could accrue from their knowledge sharing activities. They were also largely reluctant to discuss the possibility that their knowledge sharing was influenced in this way. However one was motivated by being recognised and cited whilst two others enjoyed the pleasure of sharing for its own sake as suggested by Lin (2007). There was no mention of how sharing could contribute to organisational performance in the interviews.

9.3.3 Trust

The importance of trust in knowledge sharing and its significance in organisational culture has been broadly confirmed (Pan and Scarbrough, 1999; Davenport and Prusak, 1998; Syed-Ikhsan and Rowland, 2004). Trust has been identified as a significant factor at both organisational and individual level and the impact of organisational trust on to sharing in the public sector was particularly stressed by Bock et al. (2009). Hislop (2009) also suggested that interpersonal trust as a knowledge sharing factor had been subject to much more interest in recent years. A stock of social capital

was found to be a critical determinant in the decision on whether to share knowledge Radaelli et al. (2011), and individuals tended to value knowledge from a trusted source much more than any other Granovetter (1985). Perceived status was also discovered to be a significant factor in the knowledge sharing decision (Lin, 1999).

Trust did not figure as an individual variable in factor in the structural model. However respondents generally felt that their knowledge sharing would be reciprocated by others within the department and this indicated the existence of a reasonable level of trust. The majority of interviewees indicated a high level of trust in both their colleagues and leader and were in general prepared to share research material with others. In some cases the social capital often needed for trust had been built up during a long working relationship. Two interviewees mentioned that they made a judgement about anticipated benefits, such as a trip abroad, and one interviewee would not share lecture notes because of a previous bad experience (Granovetter, 1985) thus benefits versus costs decisions were made in these cases as suggested by (Bordia et al. 2006). Although many interviewees complained that face-to-face contact was becoming more scarce and virtual means of communication increasing they did not connect this to difficulties in building up trusting relationships.

9.4 Other Relationships within the Structural Model

Propensity to share knowledge in the subjective norm, was shown to positively influence attitude towards knowledge sharing but this relationship (0.60) was less strong than the relationships in the model between organisational culture and subjective norm, and beliefs and subjective norm (0.70 and 0.82 respectively).

The Theory of Reasoned Action (TRA) suggested that subjective norm affects the attitude and therefore intention to share (Fishbein and Ajzen, 1975) and clearly this has been the case in the structural model. The

subjective norm comprises of normative beliefs and motivation to comply (with beliefs). With regard to normative beliefs, questionnaire respondents were generally agreed that there was an expectation by managers that knowledge sharing should occur but there was much less certainty about whether colleagues agreed with this standpoint. In the case of the motivation factor, respondents broadly agreed that they attempted to carry out the Vice Chancellors and colleagues wishes but were more ambivalent when asked about the wishes of managers. The strength of the relationship measured by the standardised path coefficient of these two factors was relatively low (Normative Beliefs 0.43 and Motivation 0.55). This could be explained by the high level of autonomy amongst academics that has been previously discussed as could the ambivalence with regard to manager's wishes.

Attitude to sharing knowledge was also found to positively influence intention to as it has been in similar studies such as Bock *et al.* (2005), on which the quantitative research in this study was based. This involved surveying managers from South Korean multinationals. Lin (2007) also found that positive attitudes in to sharing led to intentions in a survey of top companies in Taiwan. Joseph and Jacob (2011) Indeed, these studies are underpinned by the TRA model developed by Fishbein and Ajzen (1975) which suggests that intentions are predicted by attitudes.

9.5 Suggestions for encouraging knowledge sharing and barriers to sharing.

Interviewees were asked about the best ways to encourage knowledge sharing and most mentioned face-to-face contact as being critical. Regular meetings where sharing research material and conference information took place were particularly popular suggestions. They suggested that communal areas should be accessible so that knowledge could be shared on an opportune basis. Most also commented that departments should be located in the same building and floor to encourage sharing. Multi-person offices

were also considered an enabler although one interviewee felt that that two to an office was sufficient and careful planning was needed when deciding who should share. Others asserted that a culture that was favourable to sharing was essential. Team teaching, combination degrees, away days and newsletters were other notable suggestions as well as a knowledge sharing champion. However most stressed the importance of management commitment and sufficient time for meetings as critical having seen other initiatives perish due to lack of both factors.

When considering barriers interviewees focussed more on individual characteristics of academics. One pointed out that protecting knowledge is the key to enhancing reputation, but more academics were thought a lack of sharing may be a sign of insecurity or lack of self-efficacy, or even a lack of trust engendered by a previous bad experience when sharing knowledge.

Summary

In this chapter, the final structural model and hypothesised relationships were presented and discussed in conjunction with qualitative data and descriptive statistics. Individual factors such as individual beliefs, rewards and associations were found to be more strongly related to the subjective norm (and consequently intention to share knowledge) than organisational factors. There is a suggestion that this could be in keeping with the high level of autonomy enjoyed by academics. Trust and physical design of building were not mentioned in the questionnaire yet were highly significant themes in the semi-structured interviews. Interviewees also emphasised the critical importance of opportunities to share knowledge on a face-to-face basis. The next chapter considers the academic contribution of the research, along with implications for practice and research limitations.

Chapter 10

Conclusions

This chapter focusses on evaluating the contribution of the thesis to the literature on knowledge sharing in the higher education sector. This is followed by a discussion on ways to improve the knowledge sharing process in university departments. Research limitations are then identified along with implications for future research. Finally some thought on the PhD process overall are presented.

10.1 Contributions

The objective of this thesis was to find out how knowledge sharing between academics could be improved. Accordingly, the research aimed to develop a model of factors that affect knowledge sharing amongst academic staff and suggest ways to improve the knowledge sharing process. The original aims and objectives are listed below:

Aims

4. Contribute to knowledge sharing literature on the higher education sector by studying knowledge sharing between academics.
5. Suggest ways to improve knowledge sharing processes in university departments
6. To develop a model of factors that affect academic staff in relation to knowledge sharing.

Objectives

6. Critically review knowledge management and knowledge sharing literature
7. Critically review literature on the nature of higher education as a context for knowledge management.
8. Perform quantitative research to identify the types of knowledge shared and factors that influence knowledge sharing between academics.
9. Develop a model of knowledge sharing factors in order to test hypotheses concerning the influence of different knowledge sharing factors on attitudes and intentions.
10. Critically evaluate the research findings as a basis for recommendations regarding the improvement of knowledge sharing processes in university departments.

Literature on knowledge sharing and the higher education context has been critically reviewed. Quantitative research has been performed and factors influencing knowledge sharing in an academic context have been identified. Suggestions for improving knowledge sharing processes have emerged largely from the qualitative research and have been discussed with reference to the literature.

A research model that measures the influence of organisational and individual factors on knowledge sharing between academics has also been developed and hypothesised relationships arising from the research model have been tested in the structural model. A further significant contribution was the development of an existing scale was also achieved. Bock's (2005) scale was originally used with executives at large commercial organisations in Korea. However, in this thesis it was utilised in academia in the UK with substantial rewording and the addition of factors relevant to academia along

with supporting questions endorsed by the literature. Suggestions for improvement in the knowledge sharing process were also generated along with indications of the types of knowledge that academics share. Implications for the university departments will be discussed later in the chapter.

Academics have been shown to share research and teaching knowledge significantly more frequently than university processes and procedures, and social and work news, and were generally positive about sharing such knowledge. As in other studies in private and public organisations, culture was found to be significant factor that affects propensity to share knowledge, but in this particular study, individual beliefs were shown to have stronger relationship with knowledge sharing. Organisational culture was conceptualised as a variable comprising of components measured by questionnaires. These comprised of Leadership, Organisational Structure, Affiliation to Institution, Affiliation to Discipline, Values, Autonomy and Technology. They were all found to affect knowledge sharing in the organisational culture to varying degrees but some appeared to be much more significant than others. Leadership had the most significant relationship to culture in academia and this finding mirrored those in other sectors. Research evidence showed that academic departmental leaders were perceived as generally good role models for sharing as well as being characterised as supportive and as possessing integrity. There were however limited indications of a drift towards a transactional style in post-92 institutions.

Organisational structure was perceived much more negatively. A lack of clarity on decision making authority was attributed to the matrix structure and academics felt that it did not deliver the collaborative, sharing environment that according to the literature it should be providing. Responsibility without power in departmental management positions was linked to an inability to challenge inadequate performance but not linked by

academics to their own prized autonomy. Many academics also pointed to a drift to centralisation as an inhibitor for knowledge sharing.

Academics were divided in their affiliation between institution and affiliation to discipline and thus departmental culture could be depicted as a delicate balance between these two influences. According to research evidence affiliation to discipline was significantly higher than affiliation to institution thus demonstrating the unique character of the academic environment. However, university values were clear to academics and they thought their individual expertise was appreciated. The high level of autonomy enjoyed by academics has been well documented and the weak relationship between this factor and sharing in the organisational culture was perhaps to be expected. Academics did however appreciate the high level of autonomy they were afforded, but were more ambivalent about their use of technology. They were generally satisfied with the technology on offer as a channel for sharing knowledge but some felt that aspects of learning platforms such as forum facilitation was underused. In contrast, an overuse of email was lamented by some as a way of avoiding much needed face to face contact.

Personal belief systems had a stronger influence on knowledge sharing than organisational culture according to research findings and this is consistent with the high level of autonomy previously discussed. Social exchange theory suggests that individuals a calculation is made with regard to the benefits and drawbacks of sharing and academics were certainly motivated to share knowledge by extrinsic rewards such as recognition, promotion and attendance at conferences. They were also motivated by intrinsic factors such as the satisfaction of helping more junior colleagues but did not mention financial reward as a motivator. Most academics also thought that there was high level of trust within their departments and that knowledge sharing would be reciprocated. There was certainly little evidence of a *knowledge is power* mind-set.

Academics generally believed that knowledge sharing could be improved by more face-to face contact, regular meetings to share research and conference knowledge in particular. Shared spaces to facilitate sharing were also considered important. Joint office space was thought to be a possibility as long as a consideration of personalities involved was included. An enabling culture was mentioned as desirable, but was not generally thought of as highly significant, although a commitment by leadership to promoting such initiatives was considered to be essential. Barriers to sharing were not emphasised even though there was specific question on these at the interviews. A lack of sharing was however attributed more to insecurity and a lack of self-efficacy than to a need to protect research knowledge and reputation.

10.2 Implications for Practice

The research question was: "How can knowledge sharing between academics be improved" and a number of suggestions for academic managers have emerged from the research.

It is clear that universities do have a knowledge culture and from the research conducted it is also evident that scope exists to enhance knowledge sharing amongst academics. This would result in benefits in the creation and sharing of knowledge across universities. Such benefits could encompass interdepartmental research collaborations, sharing best practices in teaching and the promotion of links to outside organisations.

Firstly, academic managers could give more consideration to the design of new office accommodation and adaptation to existing accommodation in order to incorporate shared spaces and communal areas that allow exchange of knowledge on a face to face opportunist basis. Face to face meetings for discussing research knowledge (which was particularly highlighted by interviewees), good teaching practice and conference attendance experiences have been afforded high importance in the research findings.

However, these should have full commitment from departmental leaders, and not just be thought of as a short term eye-catching initiative. Interviewees also felt that departments located on multiple foors were a significant disincentive to sharing.

Secondly, managers could consider the impact of organisational structure on knowledge sharing, particularly on whether the matrix is facilitating a collaborative environment and if this is not the case then to try to discover the reasons why not. Consideration could also be given to the role of subject groups within the structure and if they could enable or inhibit sharing.

Many academics were concerned about the use of virtual learning platforms simply as a slide repository and if the student experience is to become more diversified and blended learning approaches are to become more common academic managers need to think about ways to encourage academics to use the platform more creatively. More well publicised training and workshops sessions could help.

Autonomy is highly prized within academia and leaders are expected to protect this situation. However, departments should reflect on the situation where many academics feel that decisions made by those with course or level responsibility are not acted upon or enforced. Perhaps this is an inescapable consequence of academic autonomy? Greater utilisation of the performance management system could be one answer but an increase in institutional position power may be seen as threat to autonomy.

10.3 Research Limitations

The research design was a two stage mixed methods approach that utilised a questionnaire for quantitative data and semi-structured interviews for qualitative data. Questionnaires were available online through Survey Monkey software and semi structured interviews were recorded using a digital voice recorder from which a transcript was made.

A principal component analysis utilising SPSS software was used to examine the questionnaire results. Subsequently, a research model was constructed using Amos software and thirteen hypotheses were constructed. Thematic analysis was used to analyse the interview transcripts and due to the comparatively small number of interviews this was done without the aid of proprietary software such as Nvivo.

A total of 317 questionnaires were collected for analysis which was more than adequate fore SPSS analysis (Pallant, 2010). However, a non-probability convenience sampling method was used because of difficulties in obtaining a stratified sample. This was mainly due to the fact Heads of Department refused to give permission for their staff to be surveyed. Thus findings may not be generalisable across other universities.

Convenience sampling is however widely used in business research because of the costs and difficulties generated by probability sampling (Bryman and Bell, 2011). In addition, Wellington (1996) pointed out that this type of sampling can help to accomplish research that would not otherwise be possible due to lack of access. Questionnaire response rates also were fairly low and varied considerably between disciplines. The rate of return for Arts and Humanities was 8.1%, rising to 12.37 % for Science and Technology and 24.78% for Social Sciences. A previously used questionnaire was utilised for the survey (Bock et al. 2005) and this could be considered an advantage because measurement and validity would have been addressed. Some researchers do however feel that originality of questions is essential (Hyman et al. 2006). A number of questions were in fact added to Bock's original to reflect the nature of the academic setting.

Subsequent qualitative research in the format of semi structured interviews enabled triangulation of data and an opportunity to investigate some relationships and themes discovered in the survey results. However, again a stratified sample was not possible and instead a purposive approach was

followed where cases are selected from using the knowledge of the researcher in order to obtain useful information, balance of disciplines and some generalisability. Due to access problems mentioned previously a total of 12 interviews were conducted.

10.4 Future Research

This study is based on Universities in the UK. Apart from some studies in Malaysia, there is limited research on knowledge sharing in academia and an understanding of the influence of different management and promotion regimes would be useful.

Data on knowledge sharing amongst academics was demographically grouped into discipline, gender, university role and length of service (both in academia in general and at current institution). Consequently knowledge sharing could be investigated on the basis of these groupings in order to discover any contrasting patterns of behaviour.

Only the knowledge sharing behaviour of academics is considered in this study. An investigation of the perspectives of academic leaders and support staff on sharing knowledge could be illuminating.

Finally, further research could attempt to measure the extent of knowledge sharing and make connecting between this and organisational success such as research output, innovation and reputation.

10.5 Reflections on the PhD process

My PhD has taken a little longer than I originally thought but I have learnt a great deal along the way. Programmes such as SPSS and Amos are now much clearer and my knowledge of Research Methods has enabled me to write study guides and supervise other students' projects. I believe that my writing style has improved and this has been recently in evidence when I

revised some sections prior to submission. Factors influencing knowledge sharing span many areas of management and consequently this has informed my lecturing in Organisational Behaviour and Human Resource Management in particular. Presenting my findings at conferences and in a journal article also has helped me become more confident and also more critical about my own work.

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Appendix 1: Questionnaire Survey

This questionnaire seeks to profile academics knowledge sharing attitudes and behaviours, and to collect data to help in understanding the factors that affect those attitudes and behaviours

The survey below will take only a few minutes of your time and I would be grateful for if you could answer the questions as accurately as you can. The answers will of course remain confidential.

How often do you share the following types of knowledge?

Please tick the appropriate box

	Never	Seldom	Sometimes	Often	Always
Research information and activities					
Teaching and learning resources and practice					
University processes and procedures					
Social and work news					

INTENTION TO SHARE KNOWLEDGE

For each statement, please rate the extent of your agreement or disagreement by ticking the appropriate box.

(1 = Strongly Disagree and 7 = Strongly Agree)

	1	2	3	4	5	6	7
I have no intention of sharing my knowledge with more departmental members							
I intend always to provide my knowledge at the request of organisational members							
I intend to share my knowledge with other organisational members less frequently in the future							
I intend to share my knowledge with any colleague if it is helpful to the organization							

THE INDIVIDUAL'S BELIEFS

Expected Rewards and Associations

For each statement, please rate the extent of your agreement or disagreement by ticking the appropriate box.

(1 = Strongly Disagree and 7 = Strongly Agree)

	1	2	3	4	5	6	7
I am less likely to be considered for interesting and prestigious projects if I engage in knowledge sharing							
I am more likely to be considered for internal promotions if I engage in knowledge sharing							
I am more likely to be considered for appointments in other universities if I engage in knowledge sharing							
I am less likely to be given the opportunity to attend conferences and other events if I share my knowledge							
My knowledge sharing would strengthen the ties between existing members and myself in the organisation							
My knowledge sharing would get me well-acquainted with new members in the organization.							
My knowledge sharing would enable me to associate more with other members in the organization							
My knowledge sharing would not result in colleagues sharing their knowledge with me.							
My knowledge sharing would create strong bonds with members who have common interests in the organization							
My knowledge sharing activities would not improve my sense of self worth							

EXPECTED CONTIBUTION

	1	2	3	4	5	6	7
My knowledge sharing would not help other members in the organization to solve problems							
My knowledge sharing would create new business opportunities for the organization							
My knowledge sharing would improve work processes in the organization							
My knowledge sharing would reduce the productivity in the organization							
My knowledge sharing would help the organization to achieve its performance objectives							

NORMATIVE BELIEFS ON KNOWLEDGE SHARING

	1	2	3	4	5	6	7
My Head of Department does not think that I should share my knowledge with other members in the organization							
My manager thinks that I should share my knowledge with other members in the organization							
My colleagues think I should share knowledge with other members of the organization							

ATTITUDE TOWARDS KNOWLEDGE SHARING

For each statement, please rate the extent of your agreement or disagreement by ticking the appropriate box.

(1 = Strongly Disagree and 7 = Strongly Agree)

	1	2	3	4	5	6	7
I do not enjoy sharing my knowledge							
Sharing my knowledge with other organizational members is a valuable experience							
Sharing my knowledge with other organisational members is a wise move							
I share my knowledge in an appropriate and effective way							

ORGANISATIONAL CULTURE

Autonomy

	1	2	3	4	5	6	7
Each person can decide his/her own way of working to accomplish tasks							
People do not have the freedom to plan their tasks							
People do not have the freedom to make major decisions regarding their tasks							
Each person can set his/her own targets							

Affiliation to Institution

	1	2	3	4	5	6	7
Members of my department keep close ties with one another							
Members of my department often fail to consider other members' standpoint							
Members of my department have strong feeling of 'one team'							
Members of my department do not co-operate well with each other							
Members of my department feel a strong loyalty to their institution							

Affiliation to Discipline

	1	2	3	4	5	6	7
Members of my department feel a strong loyalty to their academic discipline							
I have very little contact with other academics of the same discipline							
The views of other academics are important to me							
Academics in my discipline consider that building and maintaining academic networks is not a high priority							

Innovativeness

	1	2	3	4	5	6	7
My department discourages suggestions for new opportunities.							
My department puts much value on taking risks even when there is a potential for failure							
My department accords a high priority to sharing and learning the best practices from others.							
My department discourages finding new and different methods to complete tasks							

Leadership

For each statement, please rate the extent of your agreement or disagreement by ticking the appropriate box.

(1 = Strongly Disagree and 7 = Strongly Agree)

	1	2	3	4	5	6	7
The Senior Management Team holds a position of respect amongst members of my department							
The opinions of members of my department are not sought and valued by the Senior Management Team							
Members of my department have a clear view of the direction of the institution							
I can trust my manager's judgement to be sound							
Objectives are given to me which are often unreasonable							
My manager shows favouritism towards specific persons							

Values

	1	2	3	4	5	6	7
The university has a clearly articulated set of values							
The values of the university are well known and generally accepted by its members							
Employees are valued for their individual expertise							
Employees are discouraged to ask others for assistance when needed							
Employees are encouraged to discuss their work with people in other workgroups							

Structure

	1	2	3	4	5	6	7
The structure of this department inhibits interaction and knowledge sharing							
The structure of this department promotes collective rather than individualistic behaviour							
The university designs processes to facilitate knowledge exchange across departmental boundaries							
The university encourages people to go where they need for knowledge regardless of structure							

Technology Platform

	1	2	3	4	5	6	7
My organization does not foster the development of 'human-centred' information technology							
In this University, information systems and software are designed to be user friendly.							
It is difficult for me to use information systems without extra training.							
Technology that supports collaboration is rapidly placed in the hands of employees							
Technology links all members of the organisation together and to relevant external institutions							
Whenever a new technology involving communication is introduced, training is quickly provided							

Motivation to comply

	1	2	3	4	5	6	7
Generally speaking, I try to follow the Vice Chancellor's policy and intention.							
Generally speaking, I have my own views and do not accept and carry out my manager's decision							
Generally speaking, I respect and put into practice my colleagues decisions							

Personal Information: *Please tick the box that applies*

Gender: *Male* □ *Female* □

Position: *Professor* □ *Senior Lecturer* □ *Lecturer* □ *Researcher* □ *Associate or Part-time Lecturer* □

If lecturer, primary focus of work: Research □ *Teaching* □ *Administration* □

Name of Institution: _____

Academic Department: _____

Number of years in Department: _____

Number of years working in Higher Education: _____

If you would be willing to participate in further discussion on the issues raised, please supply your contact details:

Contact email: r.fullwood@mmu.ac.uk

Appendix 2: Commonalities

	Extraction
Sharing within department	.222
Knowledge at request	.183
Sharing with org	.274
Share with a colleague	.262
Involvement in projects	.291
Considered for promotions	.372
Considered for appointments	.341
Opportunity for conferences	.233
Strengthen member ties	.604
Become well acquainted	.575
Associate more with others	.527
Colleagues would not share knowledge	.372
Strong bonds created	.521
Would not improve self-worth	.408
Would not help others in the organisation	.282
would create new business opportunities	.429
Would improve work processes	.402
Would reduce productivity	.231
Would help performance	.486
HD does not think I should share knowledge	.323
Manager thinks I should share	.396
Colleagues think I should share	.410
I do not enjoy sharing	.275
Sharing with other members is valuable	.512
Sharing with other members is wise	.462

	Extraction
I share in an appropriate and effective way	.271
Each person can decide how to accomplish tasks	.405
People do not have freedom to plan	.615
People do not have freedom over major decisions	.493
Each person can set own target	.334
Have close ties with each other	.512
Fail to consider each other's standpoint	.389
Strong feeling of one team	.583
Not cooperate with each other	.584
Strong loyalty to institution	.499
Strong loyalty to academic discipline	.158
I have little contact with academics of same discipline	.211
Other academics views are important to me	.319
Building academic networks is not a high priority	.134
Suggestions for new opportunities discouraged	.272
Department values risk taking	.333
High priority to sharing and learning best practices	.530
New and different methods to complete tasks discouraged	.340
SMT respected in department	.566
Opinions not valued by SMT	.377
Clear view of direction	.455

	Extraction
Managers judgement is sound	.494
Unreasonable objectives often given to me	.431
Favouritism by manager	.427
University has clear values	.535
University values known and accepted	.590
Valued for individual expertise	.594
Discouraged to ask others for assistance	.307
Encouraged to discuss work with people in other workgroups	.383
Interaction and knowledge sharing inhibited	.395
Collective behaviour promoted	.326
Knowledge exchange facilitated between departments	.450
Encouraged to go where needed for knowledge regardless of structure	.511
Try to follow VC policy	.440
I have my own views and do not accept decisions	.361
I respect and implement colleagues decisions	.367
Human centred IT not fostered	.285
IT and software designed to be user friendly	.545
Difficult to use IT without more training	.129
Collaborative technology is rapidly shared	.570
Technology links all members together	.446
Rapid training provided for communications technology	.417

Appendix 3: Pattern Matrix

	Component				
	1	2	3	4	5
Strong feeling of one team	.782	.009	-.059	.072	.002
Not cooperate with each other	-.768	-.001	.131	-.011	.042
Have close ties with each other	.672	.154	-.062	.134	-.022
High priority to sharing and learning best practices	.659	.037	.078	-.109	-.006
Fail to consider each other's standpoint	-.618	.012	.056	-.013	.069
Strong loyalty to institution	.592	-.043	.264	-.095	-.008
Favouritism by manager	-.577	.115	-.012	.276	-.025
Interaction and knowledge sharing inhibited	-.540	.010	.020	.041	.205
Managers judgement is sound	.540	-.031	.279	-.123	-.068
Collective behaviour promoted	.497	.003	-.002	.265	-.183
HD does not think I should share knowledge	-.493	-.056	-.021	.130	-.311
Clear view of direction	.480	-.169	.392	.027	-.122
Manager thinks I should share	.478	.220	.056	-.097	.258
New and different methods to complete tasks discouraged	-.461	.022	-.074	.178	.112
Department values risk taking	.434	.017	.048	-.229	-.073
Discouraged to ask others for assistance	-.413	.004	.024	.203	.153
Encouraged to discuss work with people in other workgroups	.383	.188	.150	-.018	-.192
Opinions not valued by SMT	-.333	.050	-.296	.161	.193
I respect and implement colleagues decisions	.329	.248	.270	.260	-.072
Suggestions for new opportunities discouraged	-.326	-.010	-.088	.264	.085

	Component				
	1	2	3	4	5
I have little contact with academics of same discipline	-.303	-.211	-.122	-.039	-.002
Considered for promotions	.276	.235	.194	-.260	.238
Strong loyalty to academic discipline	.255	.187	.132	.072	.034
Become well acquainted	-.033	.785	-.014	.090	-.024
Strengthen member ties	.024	.773	.003	.025	.018
Associate more with others	-.063	.751	.022	.097	-.081
Strong bonds created	-.019	.723	.036	.011	-.012
Sharing with other members is valuable	.016	.717	-.055	.100	-.141
Sharing with other members is wise	.118	.602	-.096	.028	-.212
Would not improve self-worth	.012	-.585	.186	.184	.048
Would help performance	-.200	.560	.342	-.145	.051
Would improve work processes	-.266	.507	.271	-.206	.015
I share in an appropriate and effective way	.032	.483	.092	.090	-.087
Would not help others in the organisation	.044	-.480	-.118	.097	-.105
Colleagues think I should share	.322	.418	-.010	-.116	.125
I do not enjoy sharing	-.243	-.412	.019	-.101	-.091
Other academics views are important to me	.192	.411	.155	.091	-.068
Considered for appointments	.156	.383	.159	-.098	.311
Would reduce productivity	.006	-.367	.066	.246	-.127
Sharing with org	-.223	-.339	.218	.134	.053
Share with a colleague	.031	.318	.135	-.241	-.067
Sharing within department	-.271	-.294	.124	-.204	.111
Knowledge at request	-.018	.277	-.026	-.240	-.137
Building academic networks is not a high priority	-.134	-.181	-.164	.033	.062
University has clear values	.070	.007	.602	-.108	-.229
University values known and accepted	.170	.021	.597	-.075	-.239

	Component				
	1	2	3	4	5
Try to follow VC policy	.118	.074	.565	.061	-.151
Would create new business opportunities	-.199	.371	.499	-.108	.084
I have my own views and do not accept decisions	-.257	-.121	-.441	-.127	.056
SMT respected in department	.369	.013	.410	-.196	-.189
Valued for individual expertise	.307	-.002	.390	-.305	-.231
Colleagues would not share knowledge	-.283	-.292	.372	.190	.103
People do not have freedom to plan	-.088	.029	-.001	.769	-.014
People do not have freedom over major decisions	-.078	-.030	.052	.664	.067
Each person can decide how to accomplish tasks	-.022	-.019	.104	-.587	-.144
Each person can set own target	.028	-.022	.050	-.510	-.181
Unreasonable objectives often given to me	-.274	-.103	-.115	.337	.230
Opportunity for conferences	-.130	-.265	.171	.283	-.065
Involvement in projects	-.248	-.251	.244	.259	-.048
Collaborative technology is rapidly shared	-.006	.038	.055	.061	-.748
IT and software designed to be user friendly	-.125	.010	.171	-.113	-.689
Technology links al members together	.039	.114	.058	.035	-.630
Rapid training provided for communications technology	.004	.121	-.014	-.010	-.629
Knowledge exchange facilitated between departments	.133	.085	.027	-.104	-.572
Encouraged to go where needed for knowledge regardless of structure	.213	.069	.111	-.072	-.558
Human centred IT not fostered	-.075	-.037	-.169	.186	.364
Difficult to use IT without more training	.000	.090	.071	.190	.287

Appendix 4: Structure Matrix

	Component				
	1	2	3	4	5
Strong feeling of one team	.758	.264	.079	-.097	-.178
Not cooperate with each other	-.753	-.253	-.018	.152	.213
High priority to sharing and learning best practices	.713	.312	.220	-.272	-.207
Have close ties with each other	.691	.356	.080	-.045	-.170
Strong loyalty to institution	.649	.239	.377	-.246	-.222
Managers judgement is sound	.625	.244	.399	-.275	-.276
Fail to consider each other's standpoint	-.618	-.200	-.067	.126	.214
Interaction and knowledge sharing inhibited	-.595	-.198	-.122	.186	.345
Favouritism by manager	-.593	-.153	-.122	.377	.160
SMT respected in department	.542	.271	.537	-.351	-.391
New and different methods to complete tasks discouraged	-.535	-.200	-.196	.299	.268
Encouraged to discuss work with people in other workgroups	.532	.365	.294	-.186	-.329
Manager thinks I should share	.523	.412	.146	-.220	.102
Department values risk taking	.519	.235	.170	-.345	-.227
Clear view of direction	.517	.075	.470	-.101	-.310
Discouraged to ask others for assistance	-.491	-.190	-.102	.313	.283
Collective behaviour promoted	.486	.132	.098	.129	-.273
HD does not think I should share knowledge	-.466	-.253	-.076	.210	-.160
Unreasonable objectives often given to me	-.466	-.304	-.264	.464	.373
Opinions not valued by SMT	-.455	-.167	-.403	.283	.356

	Component				
	1	2	3	4	5
I respect and implement colleagues decisions	.429	.362	.363	.095	-.182
Suggestions for new opportunities discouraged	-.427	-.204	-.194	.360	.223
I have little contact with academics of same discipline	-.392	-.334	-.212	.086	.102
Colleagues would not share knowledge	-.387	-.370	.227	.291	.142
Sharing within department	-.337	-.329	.020	-.078	.140
Strong loyalty to academic discipline	.322	.286	.200	-.034	-.054
Strengthen member ties	.292	.776	.143	-.144	-.016
Become well acquainted	.233	.752	.119	-.074	-.032
Strong bonds created	.248	.720	.166	-.146	-.042
Associate more with others	.210	.714	.154	-.064	-.086
Sharing with other members is valuable	.277	.697	.097	-.072	-.150
Sharing with other members is wise	.365	.629	.074	-.148	-.244
Would not improve self-worth	-.217	-.588	.052	.295	.058
Would help performance	.084	.581	.414	-.250	-.006
Colleagues think I should share	.464	.552	.114	-.259	.012
Would improve work processes	.008	.505	.334	-.282	-.018
Would not help others in the organisation	-.145	-.503	-.188	.188	-.061
I share in an appropriate and effective way	.225	.495	.194	-.043	-.119
Other academics views are important to me	.366	.492	.269	-.066	-.150
Considered for appointments	.265	.477	.208	-.188	.212
I do not enjoy sharing	-.342	-.470	-.073	.027	-.030
Considered for promotions	.393	.416	.270	-.359	.084
Sharing with org	-.348	-.410	.090	.241	.100
Share with a colleague	.241	.409	.238	-.340	-.148
Would reduce productivity	-.136	-.401	-.002	.299	-.092
Involvement in projects	-.338	-.350	.134	.336	.015

	Component				
	1	2	3	4	5
Knowledge at request	.165	.322	.073	-.312	-.172
Building academic networks is not a high priority	-.253	-.269	-.238	.128	.139
University values known and accepted	.366	.218	.686	-.214	-.409
University has clear values	.267	.175	.672	-.221	-.378
Try to follow VC policy	.275	.214	.623	-.062	-.285
would create new business opportunities	.029	.411	.525	-.184	.009
Valued for individual expertise	.505	.255	.523	-.446	-.428
I have my own views and do not accept decisions	-.368	-.269	-.509	.010	.194
People do not have freedom to plan	-.245	-.168	-.090	.780	.115
People do not have freedom over major decisions	-.244	-.195	-.050	.691	.172
Each person can decide how to accomplish tasks	.158	.124	.186	-.609	-.240
Each person can set own target	.188	.114	.139	-.542	-.268
Opportunity for conferences	-.240	-.338	.081	.342	-.014
Collaborative technology is rapidly shared	.196	.063	.198	-.057	-.750
IT and software designed to be user friendly	.111	.048	.294	-.201	-.706
Technology links al members together	.245	.157	.204	-.093	-.651
Encouraged to go where needed for knowledge regardless of structure	.418	.204	.278	-.224	-.647
Rapid training provided for communications technology	.209	.147	.131	-.124	-.634
Knowledge exchange facilitated between departments	.338	.183	.188	-.235	-.629
Human centred IT not fostered	-.254	-.149	-.280	.279	.444
Difficult to use IT without more training	-.071	.051	.013	.204	.297

Appendix 5: Factor Correlation Matrix

	CR	AVE	MSV	ASV	Associations	Aut	Aff Inst	Lead	Cont	Tech	Struct	Intention	Attitude	Norms	Motivation	Rewards
Associations	0.880	0.649	0.358	0.135	0.806											
Aut	0.850	0.740	0.124	0.059	0.153	0.860										
Aff Inst	0.808	0.587	0.217	0.107	0.288	0.280	0.766									
Lead	0.841	0.517	0.480	0.210	0.280	0.352	0.466	0.719								
Cont	0.765	0.521	0.267	0.114	0.517	0.231	0.113	0.356	0.722							
Tech	0.749	0.499	0.493	0.111	0.088	0.158	0.250	0.553	0.164	0.706						
Struct	0.768	0.624	0.493	0.147	0.249	0.267	0.383	0.652	0.205	0.702	0.790					
Intention	0.700	0.548	0.147	0.103	0.373	0.309	0.245	0.384	0.355	0.183	0.299	0.740				
Attitude	0.791	0.562	0.358	0.135	0.598	0.187	0.323	0.376	0.452	0.260	0.253	0.363	0.750			
Norms	0.816	0.597	0.261	0.109	0.400	0.230	0.415	0.355	0.278	0.051	0.219	0.305	0.395	0.773		
Motivation	0.686	0.524	0.480	0.139	0.271	0.166	0.351	0.693	0.361	0.431	0.385	0.378	0.309	0.231	0.724	
Rewards	0.749	0.598	0.261	0.119	0.486	0.257	0.346	0.371	0.435	0.096	0.149	0.270	0.355	0.511	0.268	0.774

Appendix 6: Coding Frame

No	Question	Code	Theme	Sub-themes
1	Tacit Knowledge requested		Trust Time Liking Likelihood of reciprocation Research or Teaching? IP concerns Promoting own theory	Procedural – may be sensitive (affect jobs, future of dept.) (3) Post-92 universities work pressure (9) Future collaborations? (5) What's in it for me? (5) Some colleagues never share (9) Sharing is important on principle. Complete trust of colleagues (6) Person offers future reciprocation (5, 10) Research- others seek a free ride(1) Teaching material yes- Research—more difficult area (2) Research and teaching- a small favour grows larger and thus becomes more unacceptable in terms of time (1) Own teaching material copied (8) Improves profile and likelihood of citations (1), Where is the knowledge going and how will it be used (7)?
2	Knowledge Sharing Factors		Culture Personal qualities of academics Personal Values Transparency Trust Power IP Time Leadership	Critical (9), Others want me to share less (1) Can be imported with lecturers if from outside academia (5) SL's pushed to take more responsibility, more layers (3) Collaborative, open helps Individualistic, self-centred (4) Helping younger colleagues (1) Similarity of research interests (5) Gauge possibility of reciprocation early (5) Complete trust (7) Individualistic world (4) Individual Knowledge kept in the hands of a few (4) (7,8) Impacted by other factors (1,3, 7) REF/workload Impact (4) Knowledge Silos- but no interest felt in what others are doing (2)

			Structure Politics Physical structure Rewards	Subject groups Public/private agenda One or two person offices (3, 5) Same/different Location (3,5,9) Open doors Availability of common room/meeting area etc (3) Open plan (but suitable for HE?) Research output leads to promotion Pleasure of helping younger colleagues (9)
3	Leadership		Staff centred, focus on individual Integrity (1) Recognises tasks performed (5) Shares knowledge Empowers others (5) Respected (6, 10) Inspires trust (6) Relaxed, (7,10) disinterested (7) Transactional (9) Laissez faire (5,10) Invisible and absent(9) Leadership/Management structure	Tries to be available, attends many meetings (1) Emails Emails, meetings, MBWA (1), supporting research groups (5) Runs briefings (6) Seen as buffer against faculty management (6) criticised for laissez faire approach (10) Seen as a friend (6) Staff less likely to volunteer knowledge (7) Workloads imposed in unfamiliar subjects (knowledge sharing was stimulated) (8) In office dealing with emails (9) Unclear, All academics report directly to leader. Who else has authority? (2, 7) Discipline or management decisions difficult/impossible to enforce , so effective leadership is difficult (2) Decision making process unclear-no defined executive committee (4)

				Concentrated in faculty management (behind closed doors) (3) More performance management
			Expectation to share	Emails, Guides meeting agendas, Picks on certain people who are usually helpful. Decides who new staff members should share offices with. Expect material to be put on VLE
			Circulation of knowledge frowned upon No consequences for not sharing	Share because of culture (in spite of leader) (9)
4	Ways of sharing		Social media Face-to-face	Linkedin Facebook (1) Social media goes on record (2) Research (2, 3) As a collaborative response to unacceptable practice (7) Personal advice to colleagues (9)
			Emails Learning from other departments	Factual (3), briefings, Links to articles, Book recommendations Facilitated by knowledge champion (Time needed) (4) Learning from younger colleagues (4)
			Departmental meeting (7,6) Sending links to articles (5) Attending Research committees Share experiences over coffee (4) In corridor (5), Water cooler conversations Informal meetings (8) Group seminars (6) Team teaching (6,7) VLE Regular meetings with Dean (8) Academic group meetings (8) Boards looking at exam questions (9) As Year 1 co-ordinator (9)	(Situated and opportune) (7)

5	Ways to encourage		Research writing group (1,5) Monthly teaching group (1) Locate academics together in same building on same floor (1) Provide opportunity to meet face to face (10) Disseminate conference experiences to colleagues Departmental newsletter Have a working definition of knowledge transfer Management commitment Departmental meetings (6) Team teaching (6,8) Awaydays Research collaborations Employ a knowledge technologist Knowledge sharing champion (4) Give workload relief (4,2), Salary increase/promotion (4) Opportunity Other staff show interest (7) Leader shows interest (7)	Problem of time starved colleagues Physical notices to show that room is being used for knowledge sharing activities Communal areas, forums meetings To share subject interests (10) to encourage Co-construction of knowledge (3) Essential on one to one and group (4) About research and conferences, who's been accepted for conferences (5) (4) Section meetings (8) Good idea but pared back over time (2) (9) Offers of help for research, encouraging staff to present findings To encourage participation in KS (4)
6	Rewards		Emotional Extrinsic	Enjoy assisting/developing people (1,8) Bad experience with own supervisor (1) Frequent knowledge sharers get cited more, sharers are most admired in profession (1)

			Expected reciprocation Contributing to culture (7) Possible promotion (2)	
7	Why resisted		Credibility and reputation depends on retaining knowledge (4) Individualism (4) Fear of criticism Make themselves seem more knowledgeable Intellectual and emotional difficulties (1) Previous bad experience Threaten political positions (7) Existing culture (7) Fear of plagiarism (8) Selfishness (9) Aversion to more meetings (3)	Goes against the grain of what academia is about (4) Need group projects to break this (4) Academic competitiveness (4) Pressure to publish (4) Big egos (6) Academics hold on to knowledge because it is such a struggle to obtain it (1) Insecurity (Particularly in academia) (1,9) Others put their name on to paper (5) (even though individuals would share) (7)
8	Culture		Sociable, sharing Living in own world Open sharing (10,5, 6) Flexible Knowledge sharing ethos	Leads to sharing knowledge Shared offices help (6) Can be sharing and open despite leadership shortcomings (9) Informal give and take (80 For scholars and academics but not for jobbing teachers and researchers (poly mentality)
9	Structure		Subject groups	Removal meant losing a co-ordinating mechanism (1) Can be divisive/political (4) Combination degrees can break down barriers (5) Make sense because they contain the people you have the most in common with (6)

			Structure Matrix	Does not work (9,8) Does not work (3,9,8) Supposed to be a matrix but is a hierarchy Lack of clarity about leadership positions (apart from HoD) (7) Delayering has not worked (8) Same matrix cannot be applied to different subjects (4) Disastrous Unclear authority levels, no disciplinary process, no line responsibility (9)
10	Technology		Moodle or Blackboard Skype	Broadcast feature useful (1) Not used to communicate/ coordinate (2,7) due to prevailing culture(7) Potential for explicit knowledge sharing greatly underused (7) Very underused-lecture note repository (3,5) Used for discussions-Principal Lecturer sometimes guides this Needs using more not improving (5) Used for discussions (4) Videoconferencing could be enabled and used more (10) Skype used for one to one (4) Email overused instead of f to f (6)
11	Community of practice		Facebook and LinkedIn Blog	Occasional, limited (2,4,6,7) Participates often in COP (1,5)

Appendix 7: Semi-structured Interview Guide

Semi-Structured Interview Guide	
Questions	*Sources*
1. Describe a recent incident where another academic requested knowledge from you. Which factors did you consider important when considering this request?	Riege (2005) Nahapiet and Ghoshal (1998)
2. What in general affects the level of knowledge sharing within your department?	Riege (2005) Lee (2007) McDermott and O'Dell (2001)
3. Describe the ways in which you share your knowledge. Are different types of knowledge shared in different ways?	Hansen et al. (1999) Radaelli et al. (2011)
4. Describe the leadership style within your department. What effect does this have on knowledge sharing activities?	Yielder and Codling (2004) Lumby (2012)
5. Do feel that your Head of Department expects you to share your knowledge? If yes, how is this expectation communicated?	Connelly and Kelloway (2003) Srivastava et al. (2006)

6. Which rewards for sharing your knowledge do you value the most?	Bock et al. (2005) Lin (2011) Hislop (2009)
7. Suggest ways in which your University can encourage knowledge sharing?	Howell and Annansingh (2013)
8. Why do you think moves to encourage knowledge sharing may be resisted?	Tippins (2003) Cronin (2000) Riege (2003)
9. Describe the culture and structure within your department. What effect do these have on knowledge sharing? (How can these be improved?)	Dopson and McNay (1996) Lee (2007)
10. Describe the collaborative technology that links you to others in the department. (How could this be improved?)	Jarvenpaaa and Staples (2005) Noble (1998)
11. Do you belong to a community of practice? (If yes, in what ways does this affect your knowledge sharing activities?)	Wenger and Snyder (2000) Hildreth and Kimble (2004)